

Military Medical Leadership in Uniformed Medical Students:
Creating a New Assessment Instrument Using the Delphi Method

by

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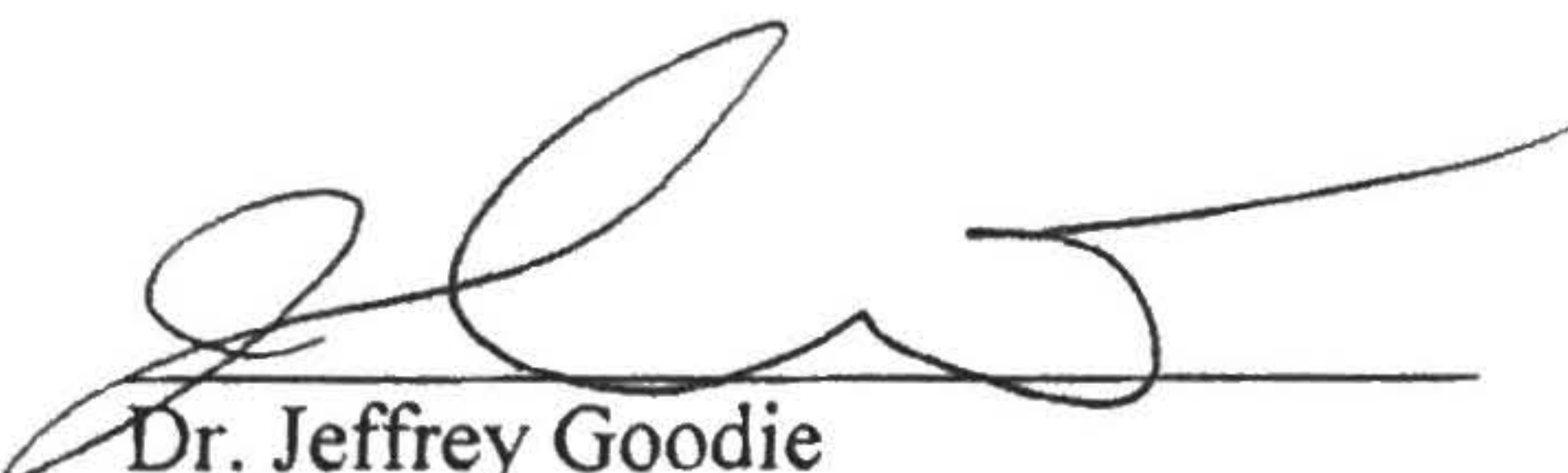


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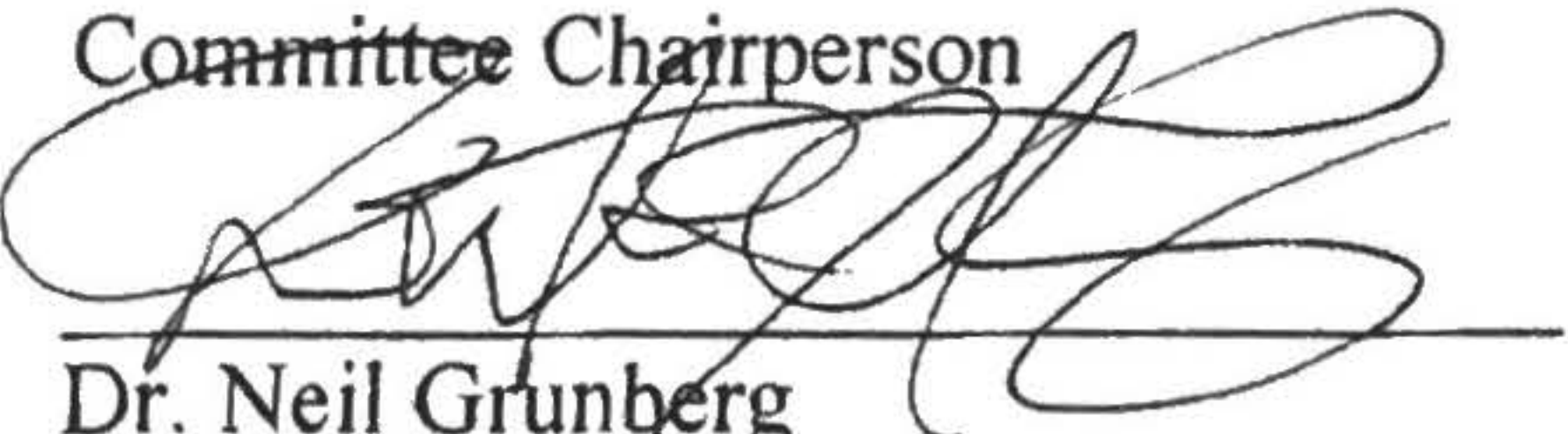
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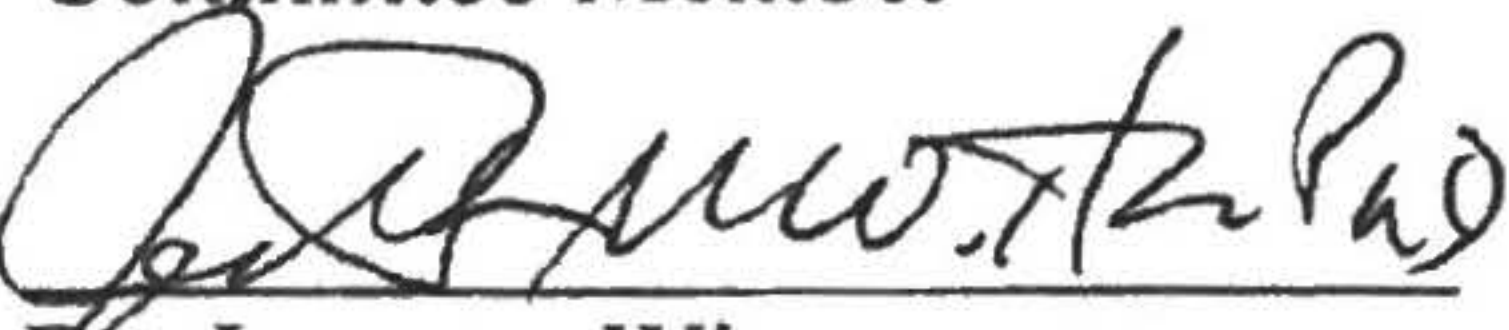
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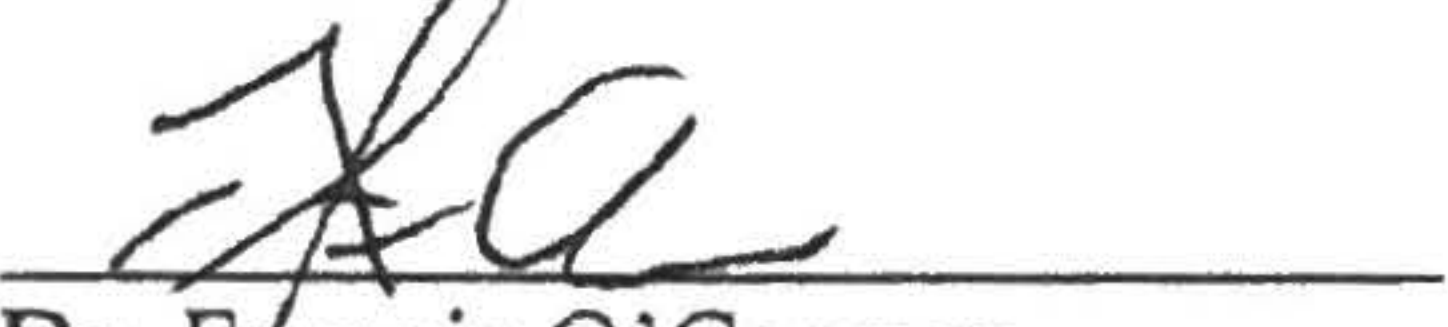
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DEDICATION

This project is dedicated to the fallen Soldiers of the 1st Battalion, 22nd Infantry Regiment.

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Although some may see the doctoral dissertation as the conclusion, for me it has been an important milestone on a wonderful journey characterized by the most amazing people I have the honor of knowing.

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Marching past, straight through to Hell

The Infantry are Seen. Accompanied by the Engineers

Artillery and Marines,

For none but the shades of Cavalrymen

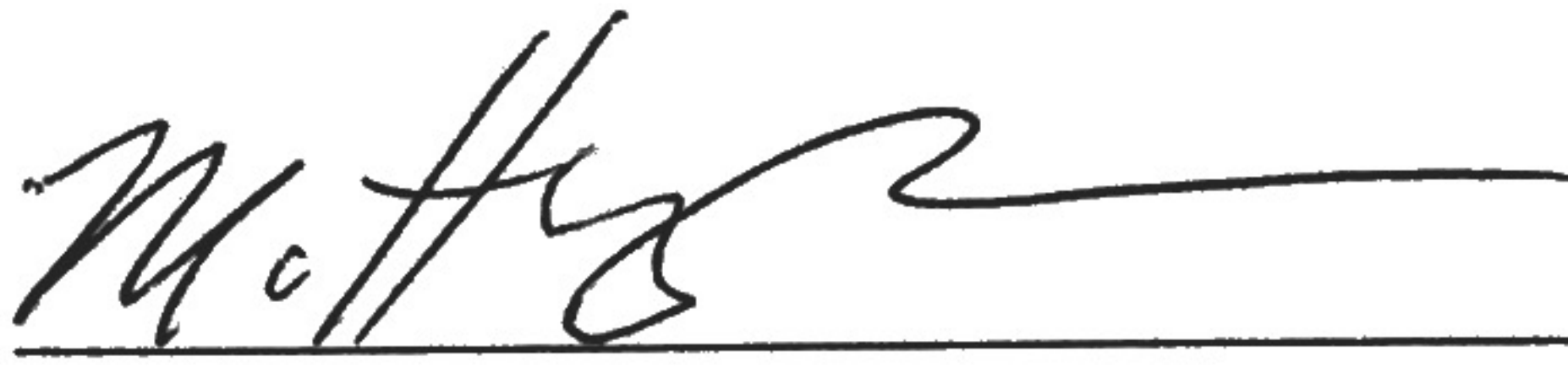
Dismount at Fiddler's Green

-- Anonymous. 1923. Fiddler's Green and Other Cavalry Songs. *Cavalry Journal*
22:121, 196-7

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[Signature]

A handwritten signature in black ink, appearing to read 'Matthew J. Moosey', written over a horizontal line.

Matthew J. Moosey

ABSTRACT

Medical leadership in the military health system (MHS) has been identified as an area of concern. Development and assessment of medical leadership among uniformed providers continues to pose unique challenges to units and organizations within the MHS. The Uniformed Services University (USU) has been identified and tasked by senior Department of Defense (DoD) leaders to bring renewed emphasis on developing leadership especially among student physicians. Currently, the Department of Military and Emergency Medicine (MEM), the academic department responsible for leadership development and assessment, has no leadership development instrument designed to assess medical leadership development in student physicians during the pre-residency years.

This doctoral project created a medical leadership assessment instrument through a standard Delphi Method. A panel of civilian and military leaders served as experts who provided input on the development and critique of a brief leadership assessment instrument through a series of online surveys. After the draft assessment was finalized through expert consensus, an additional panel of potential users at USU participated in “cognitive interviews,” where the instrument was reviewed and critiqued for accessibility, style, and clarity. The new instrument, called the Military Medical Leadership Assessment (MMLA), is discussed in relation to existing leadership theories commonly used within the military and at USU. Finally, the future of the MMLA as a valuable tool to improve civilian and military clinical practice is also discussed.

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CHAPTER 1: Introduction & Background

Introduction

In 2007, *The Washington Post* published a series of controversial articles that outlined a number of problems with patient care at Walter Reed Army Medical Center (WRAMC). Within the expose, *The Post* outlined several problems at one of the Army's most visible treatment facility. With the wars in Iraq and Afghanistan reaching a fever pitch, several hundred wounded warriors and their families were discovered to be living and being treated in conditions that were plagued with unsanitary conditions. In a piece that would later earn *The Post* a Pulitzer Prize, the articles described conditions that included rodent infested buildings, poor security, incompetent staff (92; 136), and evidence of a cover-up once the story gained traction in the media (100). The alleged failures at the Army's premier healthcare facility would ultimately lead then-Secretary of Defense Robert M. Gates to remove the Commander of WRAMC, the Army Surgeon General, and the Secretary of the Army. In a brief with reporters, Secretary Gates simply stated, "*The problems at Walter Reed appear to be problems of leadership*" (emphasis added) (156).

In response, the Army selected BG Eric Schoomaker, M.D., Ph.D., then-commander of Eisenhower Army Medical Center, Ft, Gordon, GA to take command of WRAMC and take immediate corrective action. In recounting the Walter Reed scandal and the Army's response, LTG (R) Schoomaker, who would later be appointed the Army Surgeon General, stated that many of the lessons about patient care and healthcare leadership learned in Korea, Vietnam, and Operation Desert Storm were forgotten or ignored, especially in terms of medical evacuation (MEDEVAC), patient administration, and caring for the families of wounded Warriors (160). In an interview with the author of this dissertation, LTG (R) Schoomaker stated that during his

assessment of the faculty and staff of WRAMC several key problems emerged. In the same interview, CSM (R) Althea Green-Dixon and COL (R) Charles Callahan (who were LTG (R) Schoomaker's senior enlisted adviser and chief of staff, respectively) confirmed that among the most glaring problems at WRAMC were a lack of communication, lack of mission focus, and lack of **leadership assessment**. All three leaders reported that among the first courses of action performed to address the shortcomings at WRAMC were to personally assess the leadership ability of each of the leaders at Walter Reed beyond simple medical skills and clinical competence. Additionally, LTG (R) Schoomaker brought in leadership and communications experts as outside consultants to advise the new leadership team how to best identify and assign leaders of high integrity, responsibility, and motivation to greatly improve patient administration, medical staff accountability, and resources for patient families. The changes to WRAMC's leadership culture were essential to enabling the organization to quickly recover, improve patient care, and ultimately conduct a successful merge with the National Naval Medical Center to create the Walter Reed National Military Medical Center (WRNMMC). Although the Walter Reed scandal was overshadowed by the Iraqi surge and the 2008 presidential elections, the military medical community would soon be rocked by another tragedy.

November 5th, 2009 was a beautiful fall day at Ft. Hood, Texas where nearly 50,000 troops lived, trained, and continuously deployed to Iraq and Afghanistan. The otherwise placid midmorning was shattered by the sounds of semi-automatic gunfire. Ordinarily, sounds of gunfire and explosions would have been considered fairly commonplace at the sprawling Army base, but these bullets were not fired at the hundreds of ranges that are scattered throughout the installation. The person shooting, although a Soldier assigned to Ft. Hood, was not aiming at paper targets but rather at his fellow Soldiers who were processing for eventual deployment to

Afghanistan. The shooter, MAJ Nidal Malik Hasan, had that morning given his possessions away, donned the white robes of an Islamic martyr, and then proceeded to perpetuate what then-Senator Joe Lieberman (I-CT) described as “the worst terrorist attack since 9/11” (112). Although the attack lasted only 10 minutes before Hasan was critically felled by military police returning fire, 13 of his fellow Soldiers lay dead with 30 others seriously wounded.

With Hasan in custody, the Army, the Department of Defense (DoD), and the Federal Bureau of Investigation (FBI) began an extensive investigation into the background and motivation behind the worst act of violence on a military installation in 234 years. One of the most unnerving facts about the 2009 Ft. Hood shooting is that MAJ Nidal Malik Hasan was a board certified psychiatrist and a graduate of the Uniformed Services University (USU) School of Medicine (SoM), USU’s Masters of Public Health program, and had recently completed a fellowship with the Center for Traumatic Stress at USU. When coupled with the fact that Hasan had enlisted in 1988 after graduating high school in suburban Virginia, Hasan had served over 20 years in uniform. Numerous political pundits, politicians, and the families of the wounded and murdered Soldiers pointedly asked the Army if there had been warning signs of Hasan’s radicalization over two decades of service and what could be done to prevent such attacks in the future. Investigative journalists from the *Los Angeles Times*, CBS, ABC, and *The New York Times* began to paint a picture of a deeply troubled individual, socially isolated, and increasingly vocal about his support for Islamic extremism (2; 124; 135). Former defense and intelligence officials criticized the Army Medical Department (AMEDD) for not acting on warning signs of Hasan’s increasing radicalization, workplace outbursts, praise for terror, and overall mediocre performance as a physician (112; 151). Then-Defense Secretary Robert Gates directed an extensive report in 2010 to address how the Army handled Hasan throughout his career and any

shortcomings. Chaired by former Secretary of the Army Togo West, the report (60) directly criticized the AMEDD and USU stating “*A related issue involves the alleged perpetrator’s documented performance in official records and his actual performance during his training, residency, and fellowship. Some signs were clearly missed; others ignored.*” The reports recommended courses of action for the AMEDD and USU were similarly pointed: “*We believe that some medical officers failed to apply appropriate judgment and standards of officership with the alleged perpetrator. These individuals failed to demonstrate that officership is the essence of being a member of the military profession, regardless of the officer’s specialty. We also found that **some medical officers** failed to include the alleged perpetrator’s overall performance as an officer...in his formal performance evaluations. An individual’s total performance, **academic and non-academic**, in a school environment **must be a part of the formal performance evaluation process** to preclude decisions on that individual’s career from being flawed because of incomplete information.*” (Emphasis added).

In the aftermath of the Water Reed scandal and the Ft. Hood shooting, the DoD began to re-emphasize the importance of military medical leadership and require a higher level of accountability among military healthcare leaders. In early 2009, the DoD directed the Military Health System (MHS) Office of Transformation to partner with the Rand Corporation to identify problems in developing military healthcare leadership and make appropriate recommendations. In 2011, the Rand Corporation and the MHS Office of Transformation (now known as the Defense Health Agency [DHA]) released the results of a three year study that outlined a number of problems in military healthcare leadership development. The project, *Developing Custodians of Care*, surveyed nearly 100 leaders in military and civilian healthcare settings. Among the challenges identified by healthcare leaders were the inflexible, uneven, and outdated process by

which healthcare leaders are developed **and the lack of any evaluation instrument to accurately assess healthcare leadership** (103).

The actions surrounding the shortcomings of Walter Reed, the Ft Hood Shooting report, and The Rand Corporation study have a common thread that emphasizes the importance of leadership in military medicine and unambiguously asserts that healthcare leadership is critical to the future success of uniformed healthcare. Additionally, these same sources point to healthcare leadership assessment as an essential component of ensuring continued success in the future of military healthcare. However, before such a leadership evaluation instrument is created, the current consensus of experienced leaders must be collected to identify the following:

- 1) What do expert and successful leaders believe is important in assessing leadership?
- 2) How would a potential leadership assessment instrument be created from expert consensus and guide leadership education and development in military medicine?
- 3) Can the expert consensus be incorporated into medical education and leadership development?

The present research project aimed to address these important questions by engaging multiple levels of leadership within the Military Health System (MHS) and civilian community to create a new leadership assessment instrument. It is important to note that this doctoral project was developed as part of a much larger effort at the Uniformed Services University (USU). As a result of the leadership challenges and needs identified in the past decade by the Department of Defense and MHS, USU has reenergized leadership development and education (LEAD). Although USU has developed medical leadership for over thirty years, the LEAD program was established 1 October 2014 to focus on formal leadership education, development, and assessment. In addition to traditional classroom instruction and practical exercises, the

LEAD program also includes original research designed to assess students, provide program evaluation, and develop medical leadership theory. The USU LEAD program is discussed in greater detail in the following background section, yet it is necessary to frame this doctoral project as part of the continued effort to develop meaningful leadership scholarship that addresses the critical need of medical leadership assessment as explained above. Additionally, this project will describe how the development and assessment of medical leadership is not limited to the military, but is a growing need throughout medical schools and healthcare systems throughout the United States.

The following sections include relevant background of leadership in military healthcare, leadership assessment, and the role of the Uniformed Services University (USU) in medical leadership development. This project's qualitative methods are explained through the use of the Delphi method – a structured communication technique used to develop expert consensus when little about a topic is currently known (16). The project's results are then presented, concluding with a presentation of the new Military Medical Leadership Assessment (MMLA) instrument and a discussion about how the new instrument may enhance the quality of healthcare within military and civilian settings.

Background

To understand the scope of this project and the importance of military medical leadership, the following contains a brief discussion about the military health system, current strategic-level challenges within the MHS, the importance of Joint-Service healthcare, and the role of the Uniformed Services University (USU). Each of the following background sections are intended to highlight how uniformed medical leadership has important consequences on national policy, strategic military operations, and the future of the Uniformed Services University. More importantly, the background that follows is intended to frame the importance of assessing medical leadership as an essential competency in military medicine from the patient level to national healthcare policy.

The Military Health System (MHS)

The current U.S. military health system (MHS) is one of the largest healthcare service providers in the world. As of 2014, the MHS includes 56 hospitals, 365 clinics, and more than 58,000 civilians and 86,000 uniformed personnel to provide comprehensive healthcare to 9.7 million beneficiaries (94). Additionally, the MHS provides millions of dollars in translational research, drafts military healthcare policies, and provides compensation to civilian providers who supplement healthcare for the nearly 10 million beneficiaries (94). These beneficiaries include active duty service members, uniformed retirees, and their dependents (as compared with the VA which provides care for all veterans, including those without military retirement benefits). The nonpartisan Congressional Budget Office (CBO) notes that the budget for the MHS in fiscal year 2013 was more than \$50 billion and accounts for more than 10% of the overall Department of Defense (DoD) budget. The CBO predicts that by 2030, the MHS will account for 15% of the overall DoD budget (137). The care received by beneficiaries covers virtually any healthcare

procedure, assessment, or intervention with annual out-of-pocket expenses capped at \$1000 for active duty and reserve families, and \$3000 for retirees (94). Additionally, the MHS also supports all healthcare requirements for every military mission, operation, and deployment anywhere in the world. The MHS is without peer in terms of the number of individuals provided services, the variety of healthcare services offered, and the physical environments where the MHS routinely operates - from McMurdo Station, Antarctica, to the American military astronauts living aboard the International Space Station. The unparalleled scope of operations within the MHS coupled with an uncertain financial future underscores the need for leaders who are responsible, accountable, and adaptive. This sentiment is similarly echoed among civilian healthcare providers who note that addressing the “leadership gap,” or the lack of formal leadership development and assessment programs, is critically important to improve healthcare efficiency and stem rising healthcare costs (31). The financial and political considerations of providing high quality healthcare to millions of Warriors and their families present additional leadership challenges that warrant consideration.

Financial and Political Challenges

Despite the impressive array of healthcare services, beneficiaries, and missions, the MHS is certainly not without challenges inherent within any large healthcare organization. The most obvious is cost. Healthcare costs are increasing throughout the United States and the MHS is certainly no exception. The lower patient copays, high quality care, and relative ease-of-access were reasons the CBO gave to explain the significantly higher use of both inpatient and outpatient care among MHS beneficiaries when compared with others with private healthcare insurance (94). As MHS beneficiaries grow older, live longer, and the full healthcare costs (veterans’ physical and psychological injuries and financial costs) of the current Global War on

Terror (GWOT) are assessed, there are strong doubts among lawmakers that the current MHS will be able to provide the same level of care at current costs (32). In response, both the President and the Secretary of Defense have suggested modest copay increases to meet rising health care costs in the MHS. Such suggestions have been met with strong negative reactions from lawmakers, many of whom believe that service members were “promised” free healthcare in exchange for military service (94). Public opinion from all sides of the political spectrum remains solidly against any moves to reduce or curtail veteran health benefits (106). The demands of an uncertain and unpredictable political environment underscore the need for adaptable leaders of high integrity who are able to be held accountable to Congress, the DoD, and the American people. The DoD has begun to initiate modest changes aimed at encouraging military healthcare leaders to generate creative solutions to political and financial challenges. Perhaps these changes are most clearly seen in the renewed push for joint-service healthcare leadership.

In 2013 the Secretary of Defense ordered the Deputy Secretary for Health Affairs to consolidate a number of healthcare business and policy operations (including the Office of Transformation mentioned above) into a joint-service organization called the “Defense Health Agency” (DHA). The mission of DHA is to serve as the executive health agency for the MHS to achieve medical readiness, improve health, enhance the experience of care, and lower healthcare costs. Despite the best intentions of the DHA to streamline healthcare costs and improve healthcare delivery, the nascent agency faces years of resistance to unify efforts among the medical departments of the constituent uniformed services (Army Medical Department, Navy Bureau of Medicine and Surgery, Air Force Medical Service, Public Health Service) (89; 167). The latest attempt at a unified military medical command was met with reluctance from some

high-ranking military medical leaders (149). Accordingly, each uniformed service has developed complex, expensive, and largely redundant systems to deliver care to their MHS beneficiaries (94; 137). As a compromise, the DHA was directed to assume direct control over all healthcare facilities within the Washington, D.C., area under a new umbrella designation termed “Joint-Task Force Capital Medicine (JTF-CAPMED).” What makes JTF-CAPMED unique is that each of the three DoD services represented within the MHS has a significant healthcare footprint within the vicinity of Washington, D.C., and answers to a single chain of command that consists of healthcare leaders from the Army, Navy, Air Force, Public Health Service, and DoD Civilians. In many ways, the new JTF-CAPMED represents a smaller version of what was originally envisioned by the DoD: multiple services working in unison without the inter-service rivalries and costly redundancies that have plagued past attempts to create joint uniformed healthcare. The implications for healthcare leadership reach beyond financial and political costs. The 21st Century uniformed healthcare leader must be culturally sensitive and adaptive to leading in organizations and environments previously unknown. Throughout the DoD, a new culture of joint healthcare has emerged having strong influence on how uniformed healthcare leaders are developed and assessed.

Joint Uniformed Healthcare

Despite the misgivings of some past senior military and political leadership, the support for joint military medicine is strong. A number of analyses from senior military policy institutions (46; 76; 89; 167), and the Congressional Budget Office (137) suggest that joint military medicine may save nearly half a billion dollars a year by eliminating redundant systems and cutting back waste. In response to the reluctance to create a unified medical command, LTG(R) Eric Schoomaker (149) stated that there was “merit in considering the most effective

and efficient command structures to support the strategic goals of the military health system, the services and the combatant commanders.” Fiscal and political realities are forcing the uniformed services to rapidly unify healthcare efforts in ways that only a decade ago were considered farfetched. Perhaps the most visible example is the merger of Walter Reed Army Medical Center and National Naval Medical Center to create one of the largest military hospitals in the world -- Walter Reed National Military Medical Center (WRNMMC). Another example involving the Air Force and Army, Brooks Army Medical Center and Wilford Hall Medical Center merged to create the San Antonio Military Medical Center (SAMMC). Currently, a Navy thoracic surgeon may lead a healthcare team composed of Army nurse anesthetists in a joint military treatment facility (MTF) that would have been difficult to imagine just ten years ago. This joint military medical model is even more marked in enlisted medical training, which consolidated into a single tri-service training program at Ft Sam Houston, Texas in 2011. Today, the newly minted Navy medical corpsman serving on a ballistic missile submarine deep in the Atlantic completed initial medical training with the freshly arrived Army medic located high in the Hindu-Kush Mountains of Afghanistan. Additionally, new military treatment facilities such as Ft Belvoir Community Hospital (FBCH) are designed from inception to be medical partnerships between the different services and among civilian community leaders.

In this new collaborative environment, the effective uniformed healthcare leader must inspire and lead diverse groups of people working towards common goals despite different organizational cultures, biases, experiences, and varying levels of motivation. **Developing such a leader to adapt and thrive in this environment requires new approaches to training, teaching, and assessment from a Joint-Service healthcare perspective.** However, as the Rand study highlighted above, no definition of Joint-Service healthcare leadership nor an

instrument to assess Joint-Service healthcare leadership currently exist. Fortunately, within JTF-CAPMED, there is a long-established uniformed academic healthcare institution that is uniquely capable of directly answering the gaps in Joint-Service healthcare leadership development: The Uniformed Services University (USU).

Uniformed Services University (USU)

Created by an act of Congress in 1972, USU is the only federal medical school in the United States. Sometimes called the “West Point for Doctors,” USU trains uniformed student physicians, advanced nurses, and medical scientists in the four uniformed healthcare agencies (Army, Navy, Air Force, and Public Health Service). In addition to receiving an accredited education in medicine or medical science, uniformed students at USU also receive joint-service and service-specific military leadership training designed to develop them as military medical officers. When compared to other sources of uniformed providers (Health Professions Scholarship Program [HPSP], direct commission), USU graduates serve longer in the MHS and often occupy senior levels of MHS leadership (49). Since 1972, twenty one graduates of USU have attained the rank of flag officer, including two uniformed Surgeon Generals (154).

Prior to 2014, USU’s Department of Military and Emergency Medicine (MEM) provided training in leadership development through formal classroom instruction on the art of military briefing, military medical history lectures, and Operation Bushmaster – a week-long field exercise where senior medical students and advanced practice nurses practice field medicine and small unit tactics at Ft. Indiantown Gap, PA. Although these activities met the standard for leadership education and development throughout the first several decades of USU’s establishment, the numerous political, financial, and leadership challenges outlined above has brought renewed focus on USU’s important role to develop and assess uniformed healthcare

leaders. In a meeting with USU leadership in early March of 2014, the senior ranking civilian leader in the MHS, Assistant Secretary for Health Affairs Jonathan Woodson, M.D., stated succinctly, “*USU must lead and excel in leadership training*” (136). Echoing this sentiment in the University’s 2014-2018 Year Strategic Framework (155), USU’s President Charles Rice, M.D., wrote:

*“By the end of 2015, the Uniformed Services University of the Health Sciences, recognized as the preeminent educational institution for the creation of career uniformed services health professionals **and leaders** prepared to serve the nation wherever and whenever duty calls...USU will insure that each graduate is prepared with an outstanding health education, inter-professional health training, and a deep and abiding commitment to selfless service and **responsible leadership**...”*(136) [Bold added]

The re-emphasis on leadership development has culminated in the establishment of the USU Leadership Education and Development (USU LEAD) program which is at the core of the present doctoral project.

USU Leadership Education and Development (USU LEAD)

In response to Secretary Woodson and President Rice’s strategic vision, the Uniformed Services University undertook a number of important steps and organizational changes. In the fall of 2014, retired Army Surgeon General LTG (R) Eric Schoomaker, M.D., Ph.D, was appointed as a full professor in the Department of Military and Emergency Medicine (MEM) and granted the title of Vice Chair for Leadership, Programs, and Centers. Dr. Schoomaker, who had spent the academic year of 2013 as a scholar-in-residence identifying areas to improve leadership development, immediately set to work helping to establish the USU Leadership and Development (USU-LEAD) program (136). Among the other important changes within the

University was the primary academic affiliation transfer of Neil E. Grunberg, Ph.D., a long-serving member of the Department of Medical and Clinical Psychology (MPS) and an expert in social and medical psychology, to MEM. Dr. Grunberg took on the new role of Director of Leadership Research and Development for LEAD, in addition to serving as doctoral dissertation adviser to this project, co-chair of the Bushmaster Research Activities Group (BRAG), faculty adviser to medical student leadership capstone projects, and active participant in activities related to USU LEAD.

Leadership has been identified as one of the five critical domains in the 2014-2015 USU Strategic Framework – the others being Education and Training, Research and Scholarship, National Security and Global Health Engagement, and Service (155). Leadership development has been further sectioned into “Leadership Development” and “Thought Leadership (155). This new leadership curriculum includes classroom instruction, practical exercises, and student scholarship – including three fourth year medical student capstone projects focused on peer (student-to-student) performance assessment. The USU LEAD program also has incorporated and improved existing leadership development exercises including Operation Bushmaster (described in greater detail in the following section) and Operation Gunpowder, a two day exercise developed for third year student physicians that focuses on tactical combat casualty care (TC3), teamwork, and communication.

The USU LEAD team also has started a dialogue with scholars at the three DoD service academies (United States Military Academy [USMA], United States Naval Academy [USNA], United States Air Force Academy [USFA]), and the Duke University’s “Feagin Leadership Program” - a specialty track that medical students at Duke University may opt to take prior to residency. In contrast with Duke, where leadership development is an optional specialty, every

student physician at USU is a uniformed commissioned officer who will be expected to be a dynamic healthcare leader in the challenging and continually transforming MHS described above (81). Simply, leadership development at USU is a requirement for student physicians akin to passing the United States Medical Licensing Exam (USMLE) (136).

The USU LEAD program has underscored the need to identify what components are important for uniformed healthcare leadership and how to effectively assess healthcare leadership. Moreover, as outlined above, the need for a model of uniformed healthcare leadership, and any subsequent assessment instrument, must be created with a Joint-Service perspective.

Assessment and USU LEAD

The USU LEAD program is a diverse curriculum that involves traditional classroom education, small group exercises, and mentorship opportunities between USU faculty and student physicians. Additionally, the LEAD program includes leadership research from medical students conducting capstone exercises and graduate students evaluating the efficacy of Operation Bushmaster (BRAG), a multi-day field medical exercise for advanced student physicians and nurses held annually at Ft. Indiantown Gap, PA. Operation Bushmaster is a field medicine and small unit leadership exercise, allowing the fourth year students to assume the roles of platoon leader, battalion surgeon, and patient administrator in a Role-1 (i.e., basic life support) tactical treatment setting (136). Each year, experienced civilian and uniformed faculty from USU and throughout the MHS act as evaluators, assessing individual medical and healthcare leadership skills. In after action reports (AARs) with the LEAD team, the Bushmaster faculty has identified the lack of a user-friendly Joint-Service medical leadership assessment instrument as a critical

shortage. The current doctoral project was designed to address this gap through the accomplishment of two primary objectives:

- 1) Identify what elements of healthcare leadership are important to develop in student physicians at the Uniformed Services University
- 2) Create a military medical leadership assessment instrument that is easy to use and is both face and content valid.

Before discussing how this assessment instrument was created, a historical perspective of military medical leadership assessment, relevant definitions of leadership guiding the project, and a review of the qualitative methods used in the development of the Military Medical Leadership Assessment (MMLA) is necessary.

Historical Perspective of Medical Leadership Assessment

The importance of leadership development in American military healthcare can be observed on virtually every level beginning with the establishment of a “hospital corps” by the Continental Congress in 1775. A full year before the founding framers would meet in Philadelphia and declare independence from Great Britain, the nascent American Army was already in the midst of its first crisis of military healthcare leadership. Along with the creation of the first regiment of physicians and surgeons, the Continental Congress appointed a Boston-born physician, Dr. Benjamin Church, as the Chief Physician and Director General. Church, a member of the Boston aristocracy, was less than enthusiastic about his appointment and numerous complaints about his competence flooded GEN George Washington’s besieged headquarters (115). In addition to his leadership deficits, Dr. Church had amassed significant gambling debts (13). Seeing no other alternative, Church turned to the British forces for relief and began sending classified information about Continental forces arrayed in the Boston area.

One of Church's ciphered letters was intercepted by Colonial counter-intelligence agents and he was unceremoniously cashiered from his commission and remained under house arrest for the duration of the war (73).

The following two physicians to occupy the Director General position fared little better. Dr. John Morgan, who co-founded the College of Philadelphia medical school, quit the post after incessant bickering and quarrelling among Army physicians (79). His successor, Dr. William Shippen, another well-known Philadelphia physician and bitter rival of Morgan's, lasted only a few months in his position before being court martialed for misappropriating supplies and false reporting casualty numbers to Washington's staff (115). It was not until a relatively unknown Irish American army physician named John Cochrane was appointed as Director General in the spring of 1777, that Washington and his line commanders began to develop confidence in the leadership of the Army Medical Department (AMEDD) (79).

A career Army officer, Cochrane initiated a number of important reforms to the AMEDD, including personally certifying the professional competence and quality of every regimental surgeon (163). Dr. Cochrane's focus in **assessing the military medical leadership** abilities of his subordinate physicians was essential to the very first successes of the AMEDD. After the first two years of its existence was marked by treason, incompetence, and toxic leadership, American military medicine finally began to develop as an organization that greatly enhanced the ability of the Continental Army to victory in the American Revolution. Dr. Cochrane personally visited and interviewed each regimental surgeon, assessing their medical skills and ability to support their front-line commanders. Recognizing the leadership qualities of Dr. Cochrane, GEN Washington wrote "I will mention...that I think that Dr. Cochrane...[is] among the [finest] officers of the [medical] establishment." (115). Although medicine during the

Revolution was by modern standards, still a very primitive science, military medical historians often point to Cochrane as the best example of military medical leadership during the turbulent colonial years (79). In the subsequent decades, military healthcare saw numerous changes – from the standardization of medical school training in the aftermath of the Civil War, to the eradication of tropical yellow fever under the tireless efforts of Surgeon General William Gorgas and the development of rapid aeromedical evacuation under Maj Gen Malcolm Grow (179). As Western healthcare rapidly developed in the later part of the 19th century, the need to assess quality military healthcare leadership has increased alongside the significant and rapid advances in military medicine (140).

It should be noted that Dr. Cochrane and subsequent uniformed healthcare leaders throughout history largely relied on their own intuition and personal judgment in assessing military medical leadership. These healthcare leaders, although famous for their contributions to medicine within the military and the nation, did not possess a model of healthcare leadership or a formal evaluative tool. Even as late as 1990, the Department of Defense had no objective leadership assessment instrument – healthcare or otherwise (121). Although psychological assessment has been successfully used for decades to help assign individuals to certain roles and occupations within the military and to screen for psychopathology among uniformed personnel, the field of uniformed leadership assessment has lagged far behind (34). As the Rand study (103) and DoD Leadership (60) have stated numerous times above, the gaps in leadership assessment are especially seen within the military healthcare system (MHS). The present doctoral project seeks to address this shortcoming by creating a brief military medical leadership assessment (MMLA) instrument based in scientific theory through qualitative methods described in Chapter 3.

Theoretical Perspective

Brief History of Leadership Theory

Although the present project aims to develop a new military medical leadership assessment instrument, it is necessary to ground the proposal in appropriate scientific theory. Classical texts on leadership include Homer's *Iliad*, the Babylonian Talmud, the *Tao Te Ching* of ancient China, as well as the ancient Vedic *Bhagavad Gita* (128). In modern times, the first major scientific investigation into leadership theory was in 1939, when German Jewish refugee mathematician-turned-social psychologist Kurt Lewin explored aggressive behavior in school children that had been assigned to three different groups – democratic, authoritarian, and laissez-faire (110). Lewin and his colleagues observed that children with a democratic leader were less aggressive and less hostile when compared to the other leadership styles (69). Lewin's work was particularly influential in subsequent decades (148) with the “democratic” leadership style emerging as the preferred leadership style (71). The democratic style of leadership emphasizes mutual respect between subordinates and leaders and provides opportunities for subordinates to communicate their views and participate in leader decisions (70), or what Ferguson (70) describes as “freedom with order.” This leadership style contrasts starkly with the “authoritarian” (i.e., order with no freedom) or “laissez faire” (i.e., freedom with no order) styles. Throughout the 1950s and 1960s, the democratic approach was endorsed as the preferred method for conducting group psychotherapy (64), family therapy (63), classroom instruction (65), and child rearing (23).

Despite the influence of Lewin's “Big Three” on leadership research, the typology has been critiqued in the decades following the modern American civil rights movement (38). Kippenburger (102) and Burnes (37) criticized Lewin's approach as too rigid and linear, and

asserted that leadership of organizations is an open-ended, fluid, and dynamic process. Buchanan (36) observed that Lewin's categories ignore the influence of power and politics within organizations, including racism and intolerance. Hardy (84) echoed the hierarchical concerns of Kippenburger (59) and Burnes (17) by suggesting that changes in an organization are often wholly the product of the subordinates and may not require a leader at all. Even Lewin's daughter Miriam Lewin, Ph.D., an established social psychologist in her own right, argued that the conceptualization of "democratic leadership" is poorly defined (111).

Several decades of research into leadership theory have developed new theories to address the criticisms outlined above. These theories include the Leadership Trait Approach (97; 170), Skills Approach (134), Style Leadership (29), Situational Leadership (30), and Relational Theories. Relational Theories emphasize the interpersonal dynamics between a leader and subordinates in a manner similar to the original Lewinian conceptualization, albeit with far greater emphasis on leadership as a fluid construct that Cunliffe (52) describes as "post-heroic [leader]." Relational theories of leadership include Servant Leadership (78), Authentic Leadership (11), and Transformational Leadership (39).

Importance of Relational Theories in Military Medicine

The present project did not compare and contrast these many leadership theories *in situ*. Rather, these theories are presented to acknowledge that the field of leadership research is vast and each style has unique advantages and disadvantages – especially in terms of assessment in military medicine. Of the categories presented, the creation of the MMLA in this project is largely founded in relational leadership theory. Relational theories emphasize the importance of the relationship between leaders and followers as the essential element to organizational success

and leadership effectiveness (105). A relational leadership theory is particularly useful to military medicine for the following reasons:

a. A relational leadership perspective is framed within the context of human interactions.

As medicine is inherently an interaction between human patients and providers, relational leadership is well suited for leadership training in medical schools (150) and healthcare practice (168).

b. The military is also an institution largely defined by human relationships. Relational leadership elements have high correlation with mission success in elite units (85) and military units in combat (58).

Transformational Leadership and Military Medicine

Of the relational leadership theories, the background of this project is further defined and focused with Transformational Leadership Theory (TLT). TLT, which was first proposed by Burnes (39) and later updated by Bass (19), asserts that effective leadership is accomplished through “transformative relationships” that raises the motivation of both leader and follower. The transformative relationship between leader(s) and follower(s) are characterized by four major domains: charisma, inspiration, intellectual stimulation, and individualized consideration (20).

Elements of TLT have been positively correlated to predicting the mission success of military units (22). Empirical reviews of TLT in healthcare settings show that transformative relationships between leaders and followers improves the wellbeing of healthcare providers (181) and clinical effectiveness of the healthcare organization (189). Especially important to the present proposal, TLT has been observed to promote resiliency in military units which may mitigate the effects of combat stress and trauma (18) and to counter the effects of toxic

leadership (18; 42; 62). TLT is most commonly assessed by the Multifactor Leadership Questionnaire (MLQ), a 45-item self-report assessment designed for subordinates to rate a leader and for the leader to rate themselves (21). The MLQ, which is the most widely used commercially-available leadership assessment, produces a profile that assesses how a leader rates on the four major domains of TLT (133).

TLT and the FourCe Model

Transformational leadership is not without critics. Tracey and Hinkin (175) note that the four major domains of TLT described above have significant overlap. A related criticism from Tejada, Scandura, and Pillai (172) notes the subscales on the MLQ are highly correlated to each other, and even to less effective leadership styles. Additionally, TLT does not directly address **context or the importance of group dynamics**, which is especially important in terms of leadership in military healthcare. Group dynamics have been an essential component of scholarly work into military leadership since Lewin's (109) landmark 1947 article that urged psychologists and social scientists to conduct experiments that examine how individual behavior is influenced by the physical or perceived presence of others. Dion (59) places special emphasis on the social and psychological context of a group as a major predictor of achieving group and individual goals. Other elements of context important to successful leadership and organizational success includes group norms, a shared organizational culture, and task-cohesiveness (130). Drawing lessons from observing various group therapies, Yalom (190) asserted that group climate mediates the relationship between leadership and positive outcomes.

Recognizing these gaps in TLT, Callahan and Grunberg (80) considered many leadership models and proposed a "new" model that draws on the strengths of TLT while addressing the shortcomings especially in terms of physical, psychological and social context. This model,

called the FourCe's (a mnemonic that plays on the word "Force") model, categorizes leadership into one of four major domains:

- Character: Responsibility, integrity, confidence, humility, high emotional intelligence (EQ), empathy
- Competency: Transcendent leadership skills and expertise determined by role and specialty
- Context: Physical, psychological, social environment, situations, stress
- Communication: Verbal and non-verbal; sending and receiving information.

To illustrate the point of the FourCe model in military healthcare settings, the communicative style of a neurosurgeon directing his team in the operating room at Walter Reed National Military Medical Center (WRNMMC) may be vastly different from a physician's assistant directing medics to provide emergency care under fire in Afghanistan. Both scenarios require transcendent leadership skills and rely on the character of the leader to appropriately motivate subordinates to achieve mission critical goals. Where the FourCe model expands on TLT is raising awareness of a leader to the importance of the motivation of subordinates in vastly different physical, social and psychological contexts. The creation of the MMLA is meant to bridge the FourCe model with the USU LEAD curriculum by providing direct feedback on the individual student level and indirect program evaluation. The MMLA and potential impact on advancing the FourCe model is discussed in greater detail in Chapter 5.

FourCe Model and Personal, Interpersonal, Team, & Organization (PITO)

The final component of the theoretical background necessary to frame the MMLA is the longitudinal PITO outline that complements the FourCe model. PITO, rather than a model of military medical leadership, is a leadership training plan utilized in the USU LEAD program.

Originally developed at the United States Air Force Academy (USAFA), PITO guides the USU LEAD curriculum by increasing leadership complexity and responsibility over the four years of pre-residency education (136). In the earliest phase of leadership development, the goal is to raise a student physician's personal self-awareness concerning beliefs, biases, and individual leadership style (**Personal**). This stage is followed by focusing leadership development on promoting healthy and productive **interpersonal** interactions including effective communication and emotional intelligence. In the final phase of PITO conducted at USU, the student physician begins to learn about leading small **teams**, group dynamics, and basic principles of social psychology relevant to healthcare leadership. **Organizational** leadership is introduced in medical school but typically occurs in the senior residency years. The PITO framework is introduced above to highlight how the MMLA is intended to be an instrument that may be used over time and has applicability to each stage of uniformed student physician leadership development. From this theoretical basis, definitions of leadership relevant to the assessment of military medical leadership follow.

Definitions

Numerous definitions of what constitutes leadership, healthcare, and leadership within healthcare abound. To ensure scientific rigor, the present project must first define the most important terms and concepts related to military medical leadership and leadership assessment. In introducing the definitions used for the present project, it is important to acknowledge that the perspective used hereinafter stems from the psychosocial perspective in addition to the lens of Transformational Leadership outlined above. These definitions will be re-examined in Chapter 5 as they relate to the Military Medical Leadership Assessment (MMLA).

Popularized by developmental psychologist Erik Erikson in 1950 , the Psychosocial theory conceptualized human development in eight separate stages defined by the interaction of psychological and social factors (69). Originally a human development theory, the Psychosocial theory has influenced major theories of behaviors, cognitions, and motivations (48; 90). These theories include Field Theory (108), Group Dynamics (44), the Transtheoretical Model (152), the contemporary Health Belief Model (95), the Theory of Reasoned Action (129) and formed the core of the Biopsychosocial Model (68).

Additionally, the definitions of leadership and related concepts in academic work is often defined by the inherent professional biases and perspective of the researcher(s); political scientists, sociologists, and even religious scholars all purport different definitions of leadership (6). The aim of the present project is not to discredit or dismiss the decades of research into leadership, its components, or its various definitions. It is important, however, to operationally define important concepts and terms for the present project in a manner that has special utility for healthcare and more specifically, uniformed healthcare.

Leadership: *The enhancement of behaviors, cognitions, and emotions/motivations to achieve goals that benefit individuals and groups* (80).

Few definitions have been as hotly and passionately debated than leadership. Within academic literature, the definition of leadership has gone through many evolutions – from focusing on the individual traits (i.e., the physical strength, attractiveness, personality of the leader) to being defined by the various outcomes generated by a leader’s actions or inactions (i.e., number of missions accomplished, number of budget dollars saved, number of patient safety violations) (171). It is important to note that leadership can be viewed largely as a social

construct that is influenced and shaped by the contemporary physical, social, and psychological environment of an individual or group (186).

The definition of leadership presented above stems from the FourCe model developed at USU as an extension of TLT. Essential to the definition of leadership introduced for the present project is the incorporation of the three major components of modern psychology (behaviors, thoughts, and motivations) to link the relatively little known about the assessment of military medical leadership to psychosocial theory. The definition of leadership presented in this project also draws from Transformational Leadership Theory (TLT) and the FourCe model by emphasizing the enhancement of **motivations and the group** as essential to goal accomplishment. It is important that as an assessment instrument, the MMLA is able to assess healthcare leadership in terms of the rated individual's motivational drive, and how well the leader is able to build motivation in others. This theme of motivation enhancement **by a leader** is preserved in the following definitions of Medical Leadership and Military Medical Leadership. **Medical Leadership:** *The enhancement of behaviors, cognitions, and emotions/motivations to achieve goals that benefit individuals and groups within the healthcare team, promote patient safety and health, and foster public health and national wellbeing.*

Until recently, little peer-reviewed literature addressed medical leadership (45). Critics point to the emergence of managed care in the 1970s that began to transform the role of physicians (and other doctoral-level providers) out of traditional leadership roles, ceding them to business executives, attorneys, and non-medical managers (107). In the past ten years, however, a renewed interest in medical leadership has seen the emergence of medical leadership training programs at medical schools (e.g., Columbia, Harvard, Duke, University of Southern Florida,

etc.), and a greater number of articles appearing in respected journals (*British Medical Journal*, *Harvard Business Review*, etc.).

As noted above, the definition of leadership continues to be hotly debated. In contrast, relatively little (debate or otherwise) addresses the definition of medical leadership (45). For the creation of the MMLA, the definition of medical leadership includes the “major three” components of cognitive-behavioral psychology and links them with goals of the healthcare team, patient outcomes, and national health. The definition is crafted in such a manner as to instill the MMLA with appropriate psychological science with the near-universal healthcare values of beneficence and non-maleficence (i.e., “first, do no harm”) and the responsibility of healthcare professionals that span from the individual patient to the entire nation.

It is also important to note that the term “medical leadership” as defined above may not be exclusively limited to Western Medical Model-based allopathic medicine. Although “healthcare leadership” may be a more accurate description, the present project will primarily examine developing physician leaders within the military healthcare system (MHS) where the term “medical” is a more culturally relevant term for the MMLA in a uniformed medical setting.

Military Medical Leadership: *The enhancement of behaviors, cognitions, and emotions/ motivations to achieve goals that benefit individuals and groups within the military healthcare system (MHS), foster the health of Warriors and their families, and supports the line Command mission.*

As virtually nothing exists in the formal definition or assessment of Military Medical Leadership (MML), the definition presented above is novel. As with the preceding definitions, psychological science is linked with the more specific elements of leadership in medical settings. The unique elements of the presented definition include identifying the military health system

(MHS) as the primary environment as well as Warriors and their families as the critical population served by military medical leaders. The MHS can broadly be described as the system within the Department of Defense (DoD) that provides healthcare to active duty and retired uniformed members and their dependents (27). The term “military” refers to not only the four major branches represented by the DoD (Army, Navy, Air Force, Marine Corps), but also the uniformed Public Health Service (PHS), uniformed National Oceanic and Atmospheric Administration (NOAA), and the Coast Guard. “Warrior” refers to any uniformed member of these organizations that has access to the MHS. This definition is reflected in the project’s purposeful selection of participants representing multiple uniformed services, ensuring that the MMLA may be face and content valid in Joint-healthcare settings such as USU.

Responsibility to support the Commander’s mission is perhaps the most distinguishing trait of military medical leadership. Unlike civilian medical leadership, medical leadership in the military has the legal obligation to support the Commander’s military mission through medical science and practice. The term “line Commander” is purposefully vague as it can refer to all levels of military leadership – including Non-Commissioned Officers (NCOs). Similarly, the broad scope of command included in the presented definition covers all uniformed services missions- from the tactical/ individual unit level to the national/strategic policy level. The study participants included both line-Commanders (i.e., non-medical) and line-NCOs from multiple services.

It is important to highlight that the present research project focused on the process of leadership development rather than defining who meets the definition of leader. However, based on the definition of Military Medical Leadership above, a Military Medical Leader is any uniformed healthcare professional who enhances the behaviors, cognitions, and motivations of

followers to achieve goals that benefit individual and group goals, the mission of the MHS, and the mission of the line Command. Each uniformed student physician, the target population for the MMLA, sufficiently meets this definition of Military Medical Leader.

Recent History of Military Leadership Assessment

As mentioned above, no clear assessment of leadership within the United States Military existed prior to 1990 (121). Throughout the mid-1990s, the military used a patchwork of leadership assessment instruments with relatively little validation of the effectiveness of these measures (192). Many of these instruments reflected post-Cold War, peacetime military doctrine that became largely irrelevant after 9/11 and the subsequent War on Terror (15). To reflect changes in doctrine and to address the lack of a uniform assessment instrument, the Center for Army Leadership (CAL) at Fort Leavenworth, Kansas, began a large scale project to develop a new assessment tool. Beginning in 2005, researchers at CAL created questionnaires designed to survey Non-commissioned officers (NCOs), staff officers, and commanders about leadership domains that had previously been identified and arranged into a model by leadership experts at Fort Leavenworth. Of the domains created by CAL experts, 14 were identified by study participants as having a Cronbach's alpha ($\alpha > .8$) sufficiently high enough for retention in an assessment instrument. The result of this project was released in 2009 as the "Multi-Source Assessment and Feedback System (MSAF)," a web-based assessment instrument designed to assess leaders on the domains identified by CAL in the original study. The MSAF measures the original domains using three different assessments:

I ADAPT M: A self-report instrument intended for leaders to evaluate themselves by answering yes/no questions on 46 different statements. The I ADAPT M generates a profile that produces seven subscales: crisis situations; cultural adaptability; work stress;

interpersonal adaptability; learning new tasks; technologies and procedures; creative problem solving; and uncertain and unpredictable work situations.

Leadership Behavior Scale 2.0 (LBS-2): An instrument that is both self-report and solicits feedback from superiors and subordinates. Respondents answer 50 items that assess a leader on 10 domains: Lead Others, Lead by Example, Create a Positive Environment, Communicate, Develop Leaders, Prepare Self to Lead, Get Results, Extend Influence Beyond Chain of Command, Builds Trust and Stewards the Profession. Items are Likert-style questions ranging from “Not At All Effective” to “Highly Effective.”

The Team Personality Inventory: An instrument that is both self-report and solicits feedback from superiors and subordinates. This instrument is designed to raise self-awareness regarding 8 domains related to effective team work: tough mindedness; resourcefulness, intellectual capacity; leadership motivation; achievement – seeking; interpersonal tact; teamwork; trust.

The MSAF has a number of limitations that this doctoral project addresses. The first is that the MSAF, despite it being the most widely researched and developed leadership assessment tool in the military, is Army-centric (87; 88). The Navy is currently piloting a limited assessment-feedback system within the Surface Warfare Community. The Air Force and Marine Corps do not appear to have a Service-wide assessment instrument. As described several times above, military medicine is becoming increasingly Joint-Service and any assessment instrument should incorporate the unique perspectives of all services that comprise the Military Health System (MHS). The theoretical basis for the MSAF was developed by polling military leaders over-represented by combat arms units (i.e., fewer [if any] medical providers) (88). Additionally, little else is known about the original participants used to validate the domains of

the MSAF (i.e., ethnicity, gender, education). The MMLA, in contrast, took participant demographics into consideration and ensured that the project had appropriate representation from women and ethnic minorities. The MSAF is also resource intense, requiring at least an hour to complete and several days more to provide any feedback. The MMLA instrument developed in this research project is brief, taking only a few minutes to complete. Because there does not appear to be any further research on the validity of the MSAF after 2005 (or the MSAF's underlying theoretical model), the MMLA may help to gain a more current perspective on medical leadership within the uniformed services. The implications of the MMLA on medical leadership theory is discussed in greater detail in Chapter 5.

Currently, there are several leadership assessment tools in addition to the Multidimensional Leadership Questionnaire (MHQ) and MSAF described above. One assessment instrument is Dennis and Bocarria's (57) "Servant Leadership Assessment Instrument," a 42-item instrument that measures leadership along five domains of Patterson's (145) Servant Leadership Theoretical Model. Another instrument commercially available through Linkage, Inc. is the "Leadership Assessment Instrument," which has its roots in Bemis' "Revisionist Leadership Theory" (26). Other leadership assessments stem from Feminist theories (28), Organizational psychology (93), and even a "Business Ecosystem" model (173). Some leadership assessment tools stem from an identified leadership model or theory (3, 13, 21), whereas other instruments are created by linking the assessment to important individual and group goals (139). These assessments are often financially expensive, time intensive, and are not appropriate for the constantly changing contexts (physical, social, and psychological) where military medical leadership exists. In comparison, the MMLA has no financial cost and is developed with uniformed healthcare leadership in multiple contexts as a primary focus.

Increasingly, the uniformed services have been developing their own leadership assessments that incorporate a “360 degree” view- that is, a leadership assessment that incorporates input from an individual’s superiors, peers, and subordinates. The Department of the Army’s Multisource Assessment and Feedback (MSAF) is the most widely used leadership assessment instrument within the Armed Forces, and is a “360 degree” assessment instrument (10). However, the “360” approach to leadership assessment is not without critics. Togel and Conger (174) note that “360” assessments often include both objective measures of performance and more qualitative measures of leader development. For the leader being assessed, this mixed-subject assessment may lead to confusion and frustration from feedback that may be more appropriately separated (i.e., a leader who is beloved by his peers and subordinates but achieves few organizational goals; a leader who is strongly disliked by his subordinates but admired by peers and superiors; a leader who has elicits relatively neutral feelings from peers, subordinates, and superiors, but achieves a high number of goals, etc.). Further complicating a “360” assessment is that, very often, all individuals within an organization are given the same assessment to complete, regardless of time in the organization, seniority, professional experience, etc. (74). The lack of specificity can lead to excessively incongruent feedback that is of little value to the assessed leader and may actually lead to disillusion with the assessment process and decreased leader performance (104). Others have pointed out that “360” assessments may be limited by the challenges of adapting the assessment to the culture of the assessed individual and the organization (114; 180). Often, “360” assessments are labor-intensive and time consuming, which may limit their usefulness in the fast-paced environment of uniformed medicine (182). The MMLA is especially designed for USU faculty to quickly and easily assess uniformed student physicians and provide clear and unambiguous feedback about

military medical leadership performance. Additional uses of the MMLA as a self- or peer-assessment is discussed further in Chapter 5.

Current Challenges

The MHS has identified the lack of a meaningful leadership assessment instrument as a critical shortcoming that should be addressed (103; 136). If this shortage is to be addressed, then any leadership assessment instrument must be sensitive to the challenges and critiques presented above. Such sensitivity is especially important to military medicine, where the culture and career trajectory of healthcare leaders is uniquely different- even from other leaders within the same unit. Perhaps nowhere is this distinction more clear than within the Law of War (LOW), a collection of Federal, Military, and International Laws that proscribe the conduct of modern warfare (127). Nearly every uniformed personnel within the Department of Defense (including the Coast Guard during times of conflict) is identified as a “combatant” who is given legal sanction to engage in offensive combat between two or more recognized belligerent states (127). Those uniformed personnel who fall under the category of “non-combatant” are expressly prohibited from waging any type of offensive warfare (127). In the uniformed services, such a classification applies only to chaplains and healthcare personnel.

This separation of “provider and sustainer” from the “warrior” makes sense – the mission of uniformed medicine, as the former motto of the Army Medical Department succinctly states, is to conserve the fighting strength of American warriors. This mission is so expansive and all-encompassing that practically, uniformed healthcare leaders have little ability to join their combatant sisters and brothers in engaging and destroying the enemies of the United States. Ethically, of course, the principles of non-maleficence are so central to medicine in the United States that the non-combatant nature of uniformed healthcare is a widely accepted cultural norm.

Additionally, combatant Warriors often have a wide range of opportunities to lead within the DoD, uniformed medical personnel have comparatively fewer options to develop and practice military leadership (103). The combination of inherent non-maleficence and limited leadership opportunities available to develop military medical leadership may be why leadership development in uniformed healthcare lags behind leadership development and assessment among combatant Warriors. By developing a leadership assessment instrument adapted to the unique culture of military medicine, **the MMLA seeks to narrow this gap.**

By drawing on the relative strengths of TLT augmented by the FourCe model and engaging leaders from diverse backgrounds, the central goal of this project was to create a brief leadership assessment tool that would be freely accessible to faculty and educators as well as sensitive to the unique requirements of developing outstanding uniformed physician leaders. These various leaders, who come from both medical and non-medical backgrounds, collaborated using a structured qualitative research method called the Delphi method, described in detail in Chapter 3. This project represents the first assessment instrument designed specifically to evaluate uniformed student physicians that is grounded in scientific theory, represents a joint Service perspective, and incorporates the views of a diverse background of leaders and medical educators.

Relevance of Present Project

The creation of a culturally-relevant and up-to-date medical leadership assessment instrument may have positive impact on patient care, Warrior fitness, and unit readiness. When examining the reasons why talented and capable leaders are leaving the uniformed services for civilian careers, the most common reason that veterans (medical and non-medical) give is not the deployment cycle or pay but rather, toxic leadership (153; 169; 183). A meaningful leadership

assessment designed for military healthcare may help MHS leaders identify toxic leadership traits in their subordinates and appropriately correct them. Similarly, an assessment instrument would help assist uniformed healthcare leaders to identify those subordinates who demonstrate leadership competence for more senior responsibilities and roles. Additionally, a leadership assessment instrument focused on uniformed medical students would aid leadership development programs and policies by:

- 1) Identifying critical elements of contemporary military medical leadership
- 2) Standardizing military medical leadership development and definitions in a meaningful way
- 3) Encouraging future scholarship into military medical leadership.

In early 2013, COL Charles M. Callahan, M.D., then commander of the joint-Service Ft. Belvoir Community Hospital (FBCH), edited a proposal for leadership development within the AMEDD that he and his fellow contributors call “All Physicians Lead (APL).” This ambitious program, which focuses on narrowing warrior-provider leadership gap described above through physician-led small group discussions, selected readings on leadership and formal leadership didactics (132). While this proposal acted as a call-to-action for physicians to take the initiative to increase resources and time invested into medical leadership development, one of the shortcomings identified by APL was a lack of a medical leadership assessment tool (132). The present project is mindful that an assessment instrument designed for uniformed medical students may be used in other leadership development programs, including facilities like FBCH, where USU students often rotate during medical training.

Although this project focuses on military student physicians, there is applicability to healthcare leadership outside of the military as well. The military provides a unique

environment to conduct research into leadership as most, if not all, healthcare providers in the military are leaders because of their rank, position, and responsibilities. Certainly, all of the uniformed medical students that graduate from USU are to be military medical leaders because USU is a federal service academy and leadership training is a part of USU's mission. The responsibilities of military medicine distinguish the field from civilian healthcare. Military medicine, by law and custom, has obligations to national defense (both in terms of physical security and public health), advancing the field of healthcare (both translational and clinical research), and when directed, fulfill these same obligations to partner and allied nations. The examples of military medicine successfully performing these tasks are numerous and are briefly described in the proposal background. On an even deeper level, the unique culture of the military, which provided much of the most influential early research into leadership, warrants special focus. The numerous sub-cultures that exist within the United States military, as well as the increasing interagency and international operations of military medicine, place pressure and demands on uniformed healthcare leaders in ways previously unknown (142). Additionally, the military continues to provide *in situ* laboratories for emerging healthcare management including patient centered medical home (PCMH) (61). Perhaps the most important reason that this project focuses on military medical leaders stems from the increased demand to provide Warriors and their families with high quality care from uniformed healthcare providers who are familiar with the demands and challenges within the military (126).

Finally, it is important to acknowledge that the MMLA has clinical implications for healthcare leadership beyond the MHS. Military medicine in the United States has provided high standards of clinical practice, medical research, and numerous healthcare leadership examples that American civilian healthcare has emulated for generations. If history serves as

example, then development and assessment of outstanding healthcare leaders at USU and throughout the MHS may strongly influence how civilian healthcare leaders are developed and assessed. Respecting the influence of uniformed healthcare on the entire nation as a whole is reflected in the numerous civilian community leaders who helped to create the MMLA. The clinical implications of the MMLA for providers and patients are discussed in Chapter 5.

CHAPTER 2: Research Questions

Framework

This project used qualitative methodologies to design a new assessment instrument. Qualitative methods are an appropriate research approach when little research or literature prevents the creation of meaningful hypotheses (35; 146; 164). As outlined above, little is known about assessing medical leadership – still even less is known about assessment of military medical leadership. One overarching theme of the present project is to provide qualitative research about military medical leadership assessment aimed at providing the future foundation for testable hypotheses.

Although qualitative research was at one time mischaracterized as excessively anecdotal (9), the past two decades of research using qualitative approaches have greatly increased in both number and quality (50). Additionally, qualitative methods such as the Delphi method used in this project are especially useful for research into healthcare leadership and assessment, which is discussed in further detail in Chapter 3. The present project directly examined leadership in military medicine from a diverse array of military, community, and healthcare leaders, and may be considered to indirectly demonstrate that qualitative methods are relevant in military and medical populations.

Research Questions

Unlike traditional quantitative methods which present specific aims and linked hypotheses, qualitative designs pose research questions that guide and inform research projects, while still maintaining the hallmark flexibility of qualitative research (119). The questions themselves are largely formed from the constructivist tradition – ascribing meaning to multiple

perspectives that are largely open-ended in nature with the intention of developing a meaningful pattern (51). The following research questions guided this project:

- 1) What leadership terms, concepts, or ideas do leadership experts believe are important for student physicians to develop at USU? [RQ1]
- 2) How to create an assessment instrument to best measure the leadership terms, concepts, or ideas identified in question one? [RQ2]
- 3) How does expert consensus relate to the FourCe Model of Leadership and transformational leadership theory (TLT)? [RQ3]

The present project was designed to answer these questions by collaborating with a panel of experts in leadership development. The method for data collection used in this project followed the Delphi Method which is described in the following chapter. This method was selected to generate an unbiased list of terms and concepts that were refined and subsequently integrated into the creation of a new military medical leadership assessment instrument (MMLA). In the discussion, the new MMLA is related to existing theories of leadership, especially Transformational Leadership Theory (TLT) and the FourCe Model.

CHAPTER 3: Methods

Introduction to the Delphi Method

The Delphi Method is named after the Greek oracle that provided ancient Hellenic military leaders with guidance and counsel. The method was introduced in 1950s by the RAND corporation for a USAF-sponsored study into Soviet military strategy (54). Since then, the Delphi method has been used to create novel models and instruments (53; 83; 165), collect expert consensus (113; 157), and as a means of forecasting and predicting outcomes (157; 166).

The “classic” Delphi method as outlined by Rowe and White (157) has four essential features:

1. The Delphi method participants remain anonymous to each other to facilitate frank opinions without pressures to social conformity.
2. The Delphi method consists of multiple iterations, or “waves” to allow participants to refine their views.
3. The Delphi method researcher provides “controlled feedback” – communicating the groups’ perspectives while maintaining anonymity of the group members.
4. The final product of the Delphi method is an aggregation and synthesis of the group members’ responses.

The Delphi method can broadly be described as a structured communication technique in qualitative analysis (150) where a participant panel of experts communicates with solely with an investigator while at the same time collaborating with other experts in the same field. The method has a number of important advantages but perhaps the most important to this project is that the method allows a wide variety of different leadership experts from across the country and globe to collaborate on the creation of an assessment tool, without complicated logistics and the

pressures to conformity present in other methods where participants meet with each other in person (8; 157). Additionally, the Delphi technique is especially useful when there is a topic of interest that may represent a wide range of backgrounds and experiences (191). The diversity of experiences in healthcare leadership may be considered sufficiently broad and varied to take advantage of the Delphi technique. Finally, the Delphi technique is useful where little or no research exists on a broad topic of interest (113). This method is an appropriate start to creating a military medical leadership assessment (MMLA) where none currently exists.

Contemporary Delphi Studies in Healthcare

The Delphi method is a popular methodology in modern healthcare research (56). During the past decade, the Delphi method has been used by healthcare educators to identify critical domains of medical competency (47). It also has aided healthcare decision-makers identify barriers to implementing patient safety initiatives (5). Delphi methods have assisted healthcare providers to improve diagnostic criteria for challenging chronic medical conditions, including carpal tunnel syndrome (77) and affective disorders (14). Investigators have identified research priorities within specific medical subfields using the Delphi approach (12; 24; 123) including patient-provider communication, health disparities, provider well-being, and stress.

Relevant to the present project, the Delphi method has been used for investigations into health care leadership. Carroll (43) used a Delphi study to identify important skills and attributes of nurse executives in the 21st century. Calhoun et al. (41) developed an “interprofessional competency model” for healthcare leadership by using Delphi surveys that included physicians (allopathic and osteopathic), chiropractors, podiatrists, optometrists, and dentists.

Additionally, the Delphi method has been used for leadership research within the MHS (117; 118; 162). Studies that have used the Delphi method in the MHS have identified

competencies among military medical administrators (117; 162), pharmacists (125), dentists (147), and nurses (141). These studies have largely focused on individual competencies related to healthcare management and have not focused on assessing leadership among student physicians.

A systematic review of 80 Delphi method studies by Boulkedid et al. (33) indicated that the method is useful if the expert panel is appropriately heterogeneous and motivated to participate for the entirety of the investigation. Keeney (98) concludes that although the Delphi method is largely subjective in the data collected, the method is valuable to building expert consensus in healthcare.

It is important to note that throughout the Delphi method used within this project, the experts remained anonymous to each other and that communication was exclusively limited to the individual expert and the researcher. More contemporary Delphi method studies may have expert participants play a more active role building consensus among each other – even directly communicating with one another (91). This project maintained the anonymity of the individual experts to avoid appealing to authority and pressures to conformity (157) which may be a concern when conducting studies using participants from varying military ranks and experience.

In broad terms, this project's methods included the following:

- I. Identifying and recruiting a panel of leadership experts
- II. Generate items based on an open ended query regarding assessing medical leadership in uniformed student physicians
- III. Generate questionnaire items based on a qualitative analysis of expert opinion and return these items to the panel for further revision and refinement (feedback).

IV. Querying the expert panel about how to best categorize the items in the draft questionnaire based on the FourCe Model (feedback).

V. Conducting a cognitive interview to clarify the items and improve usability.

The following section will discuss each of these methods in greater detail.

Project Methods

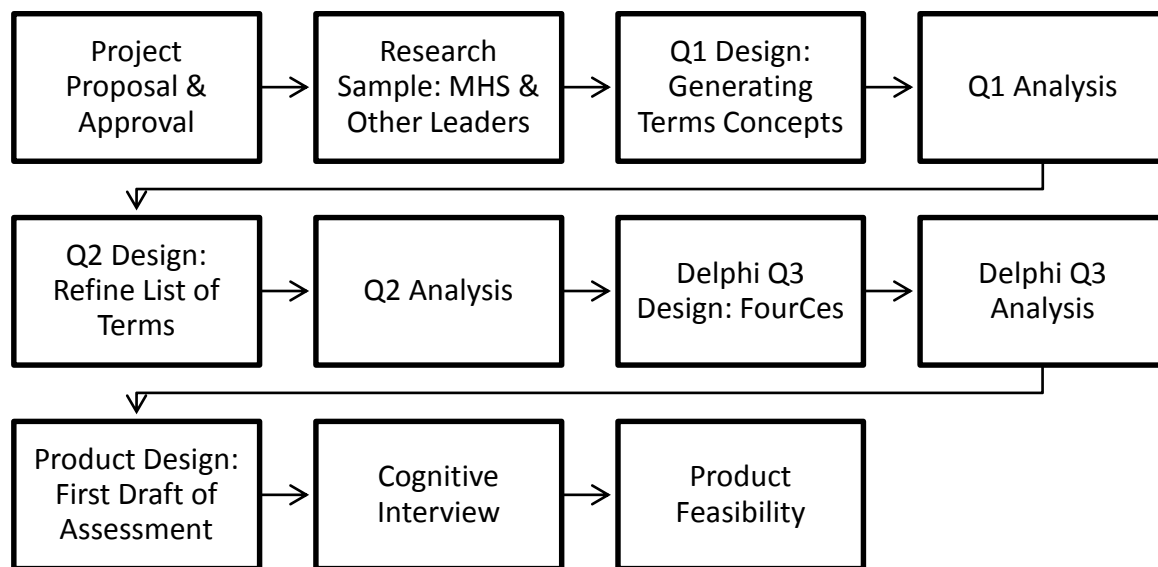


Figure 1: MMLA Delphi Process

This project used the traditional Delphi method described by Skulmoski (166) to create a new military medical leadership assessment (MMLA) instrument to assess leadership in uniformed medical students by faculty at USU.

Project Proposal & IRB Approval: This project was approved by the doctoral project Committee and by the USU Institutional Review Board (IRB) in the fall of 2014. A copy of the IRB approval for this project is located in APPENDIX D.

Research Sample: This phase consists of identifying the Delphi method participants, commonly referred to as “the experts.” Skulmoski (166) asserts that there are four essential

components necessary to be considered an expert: (a) knowledge of the subject matter being studied, (b) willingness and ability to participate, (c) sufficient time to participate, and (d) effective communication skills (4).

Working with leadership experts at USU, several current and former military leaders (both medical and line-Command) from each military service (Army, Navy, Marine Corps, Air Force, Coast Guard) who met the criteria of leadership expert were identified and asked to participate via email solicitation. Representation from each branch of service is unique to this project and gives the MMLA a joint-Service perspective, which, as noted earlier, is increasingly becoming the norm in uniformed healthcare. The panel included several types of healthcare professionals (physician and non-physician doctoral level providers), nurse providers, healthcare administrators, and non-commissioned officers (NCOs) to reflect the various professional specialties that a student physician is being trained to lead. It is also important to note that the expert panel included a greater than representational (116) number of ethnic minorities and women because gender (66; 67) and ethnicity may influence leadership style (7; 143; 178). Specific demographic data about the panel of experts in Q1 is presented in APPENDIX F.

Additionally, several ethnic minority civilian leaders (both healthcare and community) were also identified and asked to serve on the expert panel in order to gain a broader range of views on leadership and address the potential use of the MMLA in non-military settings, especially within civilian communities of color which have greater access to healthcare since the passage of the Affordable Care Act (ACA).

After identifying potential experts, each individual was contacted via scripted email and asked to participate on the panel by clicking on an embedded hyperlink. The link brought the participant to a secure website hosted by Research.net. Experts were asked to participate in at

least three “waves” of the Delphi method during the consent process (see APPENDIX C for the study information sheet), with each wave lasting approximately 30 days. Participants were asked not communicate to each other about their input to the project. Participants received information about other experts’ views via controlled communication from the researcher.

Delphi Q1 Design: This phase consists of the initial Delphi questionnaire sent to the panel of experts. Skulmoski (74) states that this round of questions should be broad and relatively open ended. Schmidt (159) refers to Q1 Design as the “brainstorm” period. The Delphi Q1 Design has parallels with Tuckman’s (176) “Storming” phase, where team members (albeit in the case of Delphi remain anonymous to each other) will spark initial creativity.

The Q1 questionnaire asked the panel member to provide demographic data including gender, race, age, branch of uniformed service, level of education, and to briefly describe their own leadership experiences to present day. The Q1 questionnaire then asked the participant to generate a list of terms and concepts related to assessing medical leadership in order to gain unbiased feedback. Experts were emailed a link to the Q1 questionnaire through the project’s secure website hosted by Research.net. A screenshot of the Q1 Survey is in APPENDIX B. After 45 days of data collection, the responses were collected and coded by three independent evaluators.

Delphi Q1 Analysis: In the traditional Delphi method, raw data from the initial survey is collected and analyzed using the qualitative method determined by the researcher (140). After consulting with qualitative analysis experts in the USU Graduate School of Nursing and Department of Preventive Medicine and Biometrics, a coding strategy was developed to analyze the raw data collected from the Q1 Questionnaire. Three independent coders from the Grunberg research lab were given the coding strategy (see APPENDIX G for a copy of the coding

instructions) and the raw data collected from the Q1 questionnaire item that asked the expert panel to provide terms, concepts, and ideas that are important to developing and accessing medical leadership in uniformed student physicians. The coders were also instructed not to communicate with each other about how they coded the data. After one week, the three coders submitted their codes to the lead researcher on hardcopy in a de-identified envelope.

Each de-identified list of codes was compared to each other for identification of items to be used for the Q2 survey. The lead researcher and an additional reviewer independently reviewed each list of codes. During this independent review, the reviewers selected codes for retention in the Q2 questionnaire that were identical among all three coders. The reviewers then compared their selections and retained only the codes that were identical among all three coders and were selected by both reviewers. A total of 62 items were identified in this manner.

Delphi Q2 Design: The Q2 survey included a list of 70 terms for the experts to rate importance on a 5-point Likert scale (1 – Not Important, 2 –Slightly Important, 3 – Somewhat Important, 4 – Moderately Important, 5 – Very Important). Of the 70 terms, 62 were terms originating from expert input in Q1. Eight additional terms predicted to be unrelated to relational theories of leadership were included for future validity studies of the MMLA and included such terms as “physical attractiveness” and “popularity.” A screenshot of the Q2 Survey is in APPENDIX B. The survey was sent out to the experts in the form of an email link uniquely tied to the email address provided in Q1 ensuring the integrity of the expert input.

Delphi Q2 Analysis: After approximately 30 days, the survey was closed and the data were analyzed. Of the 70 items that were rated by the experts, 53 items were rated as a 4.0 or higher, which was set as the threshold rating for retention in the first draft of the assessment instrument. These 53 items were examined by the project coding team to determine if the items

were conceptually similar enough to reduce the overall number of moderately important terms to a total more suitable for the draft instrument. Using a modified Q-sort and working independently, the coding team reduced the number of 53 items to 25. Additionally, four items from the validity terms list were selected for inclusion in the first draft.

Delphi Q3 Design: The purpose of the Q3 survey was to gain expert input on how to classify the 29 items identified for inclusion in the first draft of the MMLA based on the FourCe model (80) used at the Uniformed Services University (USU). The expert panel was asked to classify each of the 29 items into one of the four categories of the model: Character, Communication, Competency, or Context. As done previously, the Q3 survey was sent out to the experts in the form of an email link uniquely tied to the email address provided in Q1 ensuring the integrity of the expert input. A screenshot of the Q3 survey is in APPENDIX B.

Q3 Survey Analysis: After approximately 30 days, the survey was closed and the results were analyzed. Items were assigned to a category based on the weighted average closest to the corresponding category (i.e., 1 – Competence, 2 – Communication, 3 – Character, 4 – Context). These 4 categories formed the basis of the first draft of the MMLA. After consulting with leadership research experts at USU and the Department of Defense, the first draft of the MMLA was created. Each item was assessed using a behavior-based scale in order to minimize biases inherent to qualitative-based instruments. The items were then placed into one of the four categories based on the mode of the expert panel's response.

Cognitive Interview 1, First Draft of MMLA: Cognitive interviewing (CI) is a useful qualitative research tool where researchers administer draft questions to a group of potential users while collecting verbal information about the draft items. Although CI is not a formal qualitative research interview, the method allows investigators to collect valuable information to

determine if the draft survey is actually generating the information that the survey author wants (25). CI was included in this project to enhance face and content validity, and to gain stakeholder input without the complicated logistics of more traditional focus groups. This project followed Willis' (184) simplified approach to cognitive interviewing.

- a) Present the survey question in its original form.
- b) Collect a short description of any problems.
- c) Correct the item based on stakeholder panel member input.

For this proposal, the cognitive interview was conducted by identifying educators, leaders, and faculty members at USU who would be in a position to use the draft MMLA. A total of 22 individuals were identified and asked to participate in a web-based cognitive interview in a manner identical to the Delphi panel experts. These cognitive interviewees were sent the draft MMLA via an email link unique to their email address. For each of the 25 questions on the draft MMLA, the cognitive interviewees were asked

- a) Rate the clarity of the item on a scale of 1 to 4.
- b) Offer any brief comments to improve the question.

Detailed information about the demographics of the cognitive interviewees is presented in Chapter 4. A screen shot of the cognitive interview is located in APPENDIX B.

Cognitive Interview 2, Final Draft of MMLA: After 30 days, the cognitive interview was completed. Based on critical feedback from the stakeholders, the lead researcher and an additional reviewer made minor stylistic adjustments to the MMLA as well as add criteria to each item based on previous literature in military medical leadership, transformational leadership theory, and psychosocial theory. An additional cognitive interview was sent out to the cognitive interviewees with 24 items (one item, "Flexibility," was dropped as the interviewees indicated

that it was not meaningfully different from another item, “Adapting”). After 30 days, the second cognitive interview was concluded and the interviewee responses were collected and analyzed. Based on input from Cognitive Interview 2, minor edits were made to make the criteria and assessment items more clear. After consulting with leadership experts, the MMLA was divided into two components: an instruction and item criteria sheet, and an assessment grade sheet. The instructions and item criteria were placed on a document generated in Microsoft Word. The score sheet was generated in Microsoft Excel and listed each of the 24 items and the behavior-based assessment scale, also suggested by military leadership experts. The final draft of the MMLA instruction sheet and score sheet is located in APPENDIX E.

Product Feasibility: The final MMLA instruction sheet and score sheet were then taken to several leadership evaluators at the Uniformed Services University and the United States Military Academy. These evaluators were given the MMLA and asked to imagine an individual whose leadership the evaluator is knowledgeable. The evaluators were asked to rate this de-identified individual using the MMLA and offer comments about the amount of time required to complete the assessment, as well as how well the MMLA captured this unnamed individual’s leadership ability. The feedback gleaned from these leadership evaluators is presented in Chapter 4.

CHAPTER 4: Results

The guiding philosophy of the project's data analysis is to measure and refine expert panel input and feedback in order to produce a practical military medical leadership assessment instrument (MMLA). This project is designed to identify important components of developing medical leadership in uniformed medical students (Research Question 1), to create a leadership assessment instrument based on those important components (Research Question 2), and to relate expert consensus to current medical leadership models used at USU (Research Question 3).

Delphi Panel Demographics

The initial panel consisted of 33 experts which exceeded the guideline for 10-18 expert subjects drawn from previous investigations (16; 47; 91; 138; 161). Additionally, oversampling the initial survey allowed the project to tolerate some participant dropout from the subsequent Delphi rounds. Demographic data of the Q1 expert panel is included in APPENDIX F.

Data Analytic Strategy

Q1 Data Analysis

The Q1 survey asked expert panel participants to list as many terms, concepts, and ideas about military medical leadership as they feel appropriate. A total of 33 experts responded to the Q1 survey which was closed for input after 60 days. The open-ended data was then analyzed and coded into items by five different members of the research team who did not discuss their coding strategy with each other. Only items that were coded **identically** among the five research team members were retained for the Q2 Survey. This yielded a total of 62 items. An additional 8 items predicted to be unrelated to military medical leadership were added to allow future validation research of the MMLA.

Q2 Data Analysis

The second survey asked the expert panel to rate the importance of the generated terms and concepts on a scale of 1 (Not Important), 2 (Slightly Important), 3 (Somewhat Important), 4 (Moderately Important), and 5 (Very Important). The selection of a 1-5 scale is based on previous investigations using the Delphi study and is advantageous in that it provides a clear score for cutoff criteria – greater than 4.1, or “above average” (86; 91). Expert consensus in this project used Ulschak’s (177) criteria of 80% or more of the panel rating an item to be “moderately important.” A total of 53 items out of the original 62 items from Q1 met the threshold criteria to be considered “above average” and were retained in the final Delphi interview. After reviewing the items, the coding team found that several of the 58 items were closely related. The coding team used a Q-sort method from a previous leadership assessment research (158) to identify which items were closely related to one another by placing each item into one of three categories: behaviors, traits, and skills. Among a group of two or more similar items within each of the three categories, the item with the highest rating was selected to represent the overall concept of the item group in the first draft of the MMLA. Using this method, the coding team reduced the total number of items from 53 to 25 distinct items. A total of 28 of the original 33 experts responded to the Q2 survey. The items and their rating of importance are listed below:

Item	Score	Item	Score
Oral Communication Skills	4.75	Self-Awareness	4.39
Non-Verbal Communication Skills	4.89	Emotional Intelligence	4.36
Written Communication Skills	4.90	Selflessness	4.46
Listening	4.82	Leading by Example	4.86

Collaborating	4.32	Accountability	4.64
Motivating	4.68	Integrity	4.93
Mentoring	4.36	Patience	4.29
Problem Solving	4.61	Adaptability	4.50
Decision Making	4.54	<i>Flexibility**</i>	4.39
Time Management	4.43	Confidence	4.39
Learning	4.11	Responsibility	4.57
Mission Focus	4.50	Creativity	4.21
Cultural Sensitivity	4.25	**Flexibility was not included in the final draft of the MMLA after input from the cognitive interviewees.	

Figure 2: MMLA Items & Scores

Q3 Survey & Analysis

The Q3 Survey asked the panel to conduct a modified Q-sort of the items that met the criteria for retention as described above. A total of 25 items, along with 4 items that were predicted to be unrelated to military medical leadership included for future validity studies of the MMLA. The Delphi panel was asked to place the 29 total terms into one of four categories that consist of the FourCe Model of Medical Leadership used at USU: Communication, Competence, Character, and Context. The item was categorized based on the mode of the panel's input. A total of 25 of the original 33 experts responded to the Q3 survey. The results of Q3 are listed below, with the total number of the 25 experts who placed an item into one of the FourCe categories.

FourCe Category	Item	Competence	Communication	Character	Context
<u>Competence</u>	Decision Making	21	1	2	1
	Problem Solving	19	3	0	3
	Time Management	14	2	2	7
	Learning	14	1	2	8
	Mission Focus	10	2	5	8
<u>Communication</u>	Oral Communication	1	23	1	0
	Written Communication	5	20	0	0
	Non-Verbal Communication	0	20	2	3
	Listening	3	19	3	0
	Collaborating	5	17	2	1
	Mentoring	5	14	4	2
<u>Character</u>	Integrity	0	0	24	1
	Patience	1	1	22	1
	Selflessness	2	0	22	1
	Responsibility	4	0	20	1
	Leading by Example	3	0	18	4
	Accountability	3	3	15	3
	Emotional Intelligence	3	6	13	3
	Self-Awareness	7	1	13	4
	Confidence	9	1	12	3
	Adaptability	7	0	12	6
<u>Context</u>	Creativity	7	0	7	11
	Cultural Sensitivity	4	4	7	10

Figure 3: MMLA Items in the FourCe Model

CI 1 Survey & Analysis

The 25 items generated and rated moderately important or higher was then fashioned into the first draft of the MMLA instrument. Additionally, expert input from Q3 determined which categories the items would be placed within the MMLA. As described above, several educators and experts within USU and the Walter Reed National Military Medical Center were approached and recruited to participate in a cognitive interview. Each question on the first draft MMLA was assessed for clarity and on a 1-5 Likert Scale: Not at all Clear (Score=1), Slightly Clear (Score=2), Mostly Clear (Score=3), and Very Clear (Score=4). This rating was adapted from previous surveys using the cognitive interview method (184). Cognitive Interviewees were also

asked to provide brief comments to improve the clarity and quality of the item. The 4 items predicted to be unrelated to military medical leadership were not included in the cognitive interview.

A total of 15 cognitive interviewees responded to the C1 survey within the allotted 30 days, meeting the suggested requirement of 10-15 interviewees established by previous studies (185). Based on the ratings of clarity and the comments provided by the interviewees, 24 items were retained for an additional cognitive interview. One item, “Flexibility” was critiqued by several of the interviewees as being too similar to “Adaptability.” For the second cognitive interview, “Adaptability” was retained bringing a total of 24 items to the final draft of the MMLA. Additionally, a common critique among the panel was the lack of rating scale and item criteria. For the second cognitive interview, criteria for each item was developed based on concepts developed from Transformational Leadership Theory (TLT) (20), the USU FourCe Leadership Model (80), and Psychosocial Theory. Additionally, a behavior-based rating scale was developed after consulting with military behavioral-science experts who indicated that such a scale would minimize bias and allow for a more objective and specific leadership assessment (120). The scale developed for the MMLA ranged from Almost Never—Infrequently—Sometimes—Often—Almost Always.

C2 Survey & Analysis

A second cognitive interview was sent to the interviewees and asked them to rate the item criteria and assessment question for each of the 24 items, as well as offer any comments to make the items more clear. A total of 10 interviewees responded to the cognitive interview in the 30 days allotted for the C2 survey, meeting the requirement of 10-15 interviewees suggested by previous research (184; 185). A total of 8 items that were rated lower than 3 (Moderately Clear)

were examined and adjusted based on the comments provided by the interviewees. The final draft of the MMLA is included in APPENDIX E.

Product Feasibility

The MMLA was then brought to a small group of leadership evaluators at the United States Military Academy. The evaluators were asked to assess an anonymous individual whom the evaluator is familiar, especially in terms of leadership style, skills, and behaviors. The evaluator was then asked how long the assessment of the anonymous individual took, how well the assessment captured the anonymous individual's leadership behaviors, and if the assessment would be useful in potentially assisting the leadership development of the anonymous individual. A total of 4 individuals completed this exercise. The average time to complete the assessment was approximately 3 minutes.

Comments from USMA Evaluator 1: After completing the MMLA, Evaluator 1 mentioned that as he was assessing the anonymous individual, he was simultaneously assessing his own leadership abilities among the 24 items. He stated that this was a unique quality of the MMLA and that he had never simultaneously self-assessed while evaluating another individual. Evaluator 1 suggested that the MMLA be used as a self-assessment measure as well as a faculty-to-student assessment.

Comments from USMA Evaluator 2: Evaluator 2 stated that he was pleased with the use of emotional intelligence as an item related to leadership. Evaluator 2 also stated that the concepts of emotional intelligence and self-awareness, while familiar to younger individuals, may not be as widely understood by older evaluators. He suggested that any evaluator using the MMLA be familiar with the concepts of emotional intelligence and self-awareness, and that these two items may not necessarily be mutually exclusive.

Comments from USMA Evaluator 3: Evaluator 3 took approximately two minutes to complete the assessment. He then compared it to the current assessment tool used at USMA and suggested that the MMLA be digitized for faculty portability. Evaluator 3 also noted that the behavior-based scale was simpler to assess than qualitative scales often used in military leadership assessments.

Comments from USMA Evaluator 4: Evaluator 4 took the longest time of the four evaluators, completing the MMLA in approximately four minutes. She was interested in how the items were generated and suggested that the instruction sheet might include a brief statement as to where the items came from in order to give the MMLA source credibility with uniformed evaluators.

CHAPTER 5: Discussion

Leadership in uniformed medicine has been identified as a critical need by the Department of Defense, the individual uniformed services, and the Uniformed Services University. The purpose of this project was to create a brief military medical leadership assessment (MMLA) instrument through the Delphi Method, a structured qualitative communication technique where experts work collaboratively while remaining anonymous to each other. The Delphi Method consists of several rounds of survey interviews between the expert panel and the investigator, who analyzes the data and provides controlled feedback to the panel. In this project, 33 leadership experts volunteered to collaborate in order to generate items thought to be important to assessing uniformed student physicians in medical leadership. Subsequent coding from the project research team identified 25 unique items. An additional interview method, cognitive interviewing, improved the mechanics and clarity of the items into a brief leadership assessment instrument containing 24 items categorized into the four domains of the FourCe Medical Leadership Model and linked to a behavior-based rating scale.

This project had three research questions which will frame the discussion throughout this chapter. For each research question, the projects results, limitations, and future directions will be presented. At the conclusion of this chapter, the overall clinical implications of the Military Medical Leadership Assessment (MMLA) will be discussed.

Research Question 1 (RQ1)

What leadership terms, concepts, or ideas do leadership experts believe are important for student physicians to develop at USU?

RQ1 Results

To answer and discuss RQ1, the first two rounds of Delphi Panel surveys offer the most interpretation. Several hundred words and phrases were generated by the initial 33 leadership experts in the first round of Delphi method surveys. The purpose of this stage of the project was to generate unprompted and unbiased feedback in order to build the foundation for an assessment instrument where one currently did not exist. As with most qualitative research, some level of coding analysis must be performed in order to make the relatively large amount of unfiltered and open-ended data into useful information required to answer RQ1. This project took 5 individual coders that independently examined the data generated by the 33 Delphi experts and coded them into 62 terms that each coder unanimously agreed. Although 62 items were identified, these items had yet to be identified as important by expert consensus. An additional Delphi survey round would be required in order for the panel to identify which of the 62 items were sufficiently important to assessing leadership in uniformed medical students. The second Delphi Panel survey (Q2) and subsequent Q-sort from the project coding team identified 25 items as unique and meeting the previously set threshold of $S > 4.0$.

According to the expert panel, items rated very important included integrity, leading by example, and effective communications skills. The importance ascribed to these items indicate that leadership experts desire to see student physicians with a strong internally consistent moral code, as well as the ability to effectively express information in multiple ways. These findings correspond well with this project's focus on developing leadership assessment using relational

leadership theories – Transformational Leadership Theory (TLT) in particular. Returning to the four major components of TLT: Idealized Influence, Motivation, Individualized Consideration, and Intellectual Stimulation (19), the items identified by the expert panel are consistent with TLT. Leading by example can be linked to Idealized Influence as TLT asserts that a Transformational Leader must provide an appropriate positive role model. The MMLA items of motivation, leading by example, and integrity may address a criticism of TLT: the emphasis on charisma. The focus on charisma in TLT inspires Khoo (101) and others to warn against the “dark-side” of charisma using examples of charismatic, yet nefarious leaders throughout history. A leader’s integrity – an internally consistent and strong set of moral principles – may help to address this particular criticism of TLT. Additional discussion about the MMLA and current leadership is presented later in this chapter under research question 3 (RQ3).

To summarize, this project was among the first leadership assessments that has focused on medical leadership in uniformed student physicians that brought various leaders from all branches of the Department of Defense (DoD) and the civilian community to collaboratively identify terms, ideas, and concepts important to military medical leadership. In answering RQ1, a diverse group of Leadership experts, medical school educators, and qualitative coders identified 24 total items assessed to be moderately-to-very important that are distinct and can be subsequently placed into a draft assessment instrument.

RQ1 Limitations

The project’s limitations in answering RQ1 include the coding strategy used to identify the MMLA items from the raw and unbiased data collected in the first round of Delphi interviews. The coding strategy used in this project, while reasonably following methods used in other qualitative projects (17), such as using multiple independent raters and purposeful

sampling, lacks an important element in qualitative research: grounded theory. As explained in the project's background, the purpose of this project was to identify terms and concepts important to developing leadership in uniformed medical students and not to advance a new theory of military medical leadership. Although this project proposes some new definitions and draws from established leadership theories, further research is needed to develop a new and culturally competent grounded theory of military medical leadership. Some future directions for developing models of military leadership are expounded below.

RQ1 Future Directions

These 24 items are perhaps one of the best foundations for the creation of a new grounded theory of military medical leadership that may help to address the major limitation of coding strategy. In the most direct terms, new grounded theories are generated by the data collected (75). The project's 24 items should be examined, critiqued, and re-evaluated in real-life settings (e.g., using the MMLA with uniformed student physicians) in order to A) validate the new FourCe Leadership model proposed at USU as a definitive grounded theory of military medical leadership, and B) identify additional components of military medical leadership theory that is not currently reflected in the FourCe Model.

Additionally, these items should not be viewed as static or fixed. Indeed, a common criticism has been that the recent field of leadership research has been too constrained and inflexible to natural changes in evolving social and psychological environments (72). As these items form the foundation for potential advancements in grounded theory, this project's items may adjust to be more representative of advancements in both theory and application in specificity or sensitivity. Such adjustments might be made by asking leadership experts in other fields of healthcare (i.e., what items are important for student nurses to develop) or in entirely

different professions including among military leaders in training, where uniformed doctrine often forms the basis of assessment. It would be useful for future studies to continue to develop the items in order to identify what (if any) items are unique to healthcare leadership and what items may transcend organizational and professional cultures.

Research Question 2 (RQ2)

How to create an assessment instrument to best measure the leadership terms, concepts, or ideas identified in question one?

RQ2 Results

Addressing RQ2 focuses the discussion on the project coding strategy, and the cognitive interview. These stages of the project composed the bulk of the creation of the Military Medical Leadership Assessment (MMLA).

Prior to the recruitment of the first Delphi expert panel member, the author informally surveyed several leadership experts at the Uniformed Services University in order to gain a sense of what a useful assessment instrument might physically resemble. These experts reported that an ideal assessment would be relatively brief and able to support the assessment of several student physicians over multiple time points throughout their medical school training. Such comments were similarly reflected within the cognitive interview, where interviewees often critiqued the assessment as being too vague and lengthy to be practically useful.

It was in this spirit, that the MMLA was purposefully crafted to be portable, limited in length, and as specific as practically possible – which is reflected in the coding strategy used by the project coding team. The process of fashioning the assessment instrument, although projective, highlights the strength of the Delphi method. From all over the world, a highly diverse and talented group of leadership experts were able to collaborate on the creation of a new

medical leadership assessment. In the first round of surveys, a large collection of raw data was collected that yielded in excess of 100 distinct codes among 6 individual coders working independently. Although these codes were interesting, an additional refinement in the form of two additional Delphi surveys and a Q sort from the project coding team were necessary to pare the items down to a number that would support the project's underlying ethos of being physically practical to the intended end user: leadership assessors at the Uniformed Services University.

However, without a grounded theory and large coding team, an additional component of instrument creation would be necessary. The project's cognitive interview partially addressed the project's methodological limitation by engaging the cognitive processes of individuals who may largely be characterized as potential users of the new instrument. Cognitive processes especially useful in this project included overall attention, comprehension of the items, and memory – elements that are critical to developing content validity in new healthcare evaluation instruments (144). The project's cognitive interviews have provided some foundational structure that enables the intended faculty evaluator increased clarity and ease while the MMLA undergoes formal validation.

The end result of research question 2 (RQ2) saw the creation of a three page assessment instrument to assess medical leadership in student physicians. Based on critical feedback from both rounds of the cognitive interview, the items were described with brief criteria developed from established definitions and theories including Lewinian leadership psychology, psychosocial development, and Transformational Leadership Theory (TLT). A new behavior-based scale was placed on a separate single-page score sheet that also included a space for free-text comments tied to each item as well as overall. This is the first leadership assessment instrument that has incorporated a purposefully diverse, joint-service, and inter-professional

perspective on developing leadership in student physicians. The strength of this instrument lies in the fact that it was created with the conceptual and technical input of the leaders and educators that would be most likely to use the MMLA in various settings.

RQ2 Limitations

The most important limitation of the project in addressing RQ2 is that the MMLA, while created using sound methods and from accepted theories, remains an instrument that requires validity. Validation of the MMLA will likely take additional research in order to establish if the instrument is meaningfully measuring an individual's current leadership prowess, as well as longitudinally measure performance over time.

Another limitation of the MMLA when answering RQ2 is the subjective input from the project's coders. For this project, three doctoral students, and two research associates well versed in psychosocial theory, transformational leadership, and research methods were utilized to analyze and codify the data at two critical time points. Although these individuals were knowledgeable and used strategies from previous leadership assessment projects, additional coders with more extensive experience in qualitative analysis may have yielded more sensitive and specific items. As the same coders were used throughout the project, the reliability of the MMLA may be limited.

Similarly, while the cognitive interviews conducted for this project were extremely useful, they were limited to approximately 10 interviewees that communicated through an online-based survey. Other forms of cognitive interviewing may take place using in-person focus groups where the researcher is able to gather larger amounts of verbal and non-verbal data related to an instrument's clarity, utility, and ease of use. In person cognitive interviews with

larger groups of MMLA users may help to address this limitation as the measure undergoes validation.

RQ2 Future Directions

The next essential step for the MMLA is the use of the instrument to assess leadership among student physicians at the Uniformed Services University (USU) and elsewhere. Fortunately, the MMLA is (at the time of this publication) being considered for use in the 2015 cycle of Operation Bushmaster and among student physicians at the University of South Florida (USF). With the valuable input of the Delphi panel and the cognitive interviewees, the instrument may be reasonably assumed to have adequate face and content validity (40).

What remains necessary is for the MMLA to undergo rigorous formal criterion and construct validity, as well as analysis of the reliability of the MMLA among a wide range of assessors, leaders, and educators. Such validation should be initiated not only at the Uniformed Services University, but by the broad variety of uniformed and civilian institutions represented in the Delphi panel. Future validation of the MMLA may also include factor analysis of the items as related to each other, which may address a frequent criticism of leadership assessment, namely, that items are too interrelated (172).

Proceeding forward, the MMLA should be used in organizations where effective (and even ineffective) leaders have already been identified. Leadership evaluators in these organizations should evaluate these known “leadership quantities” using the MMLA in order to evaluate the instrument’s sensitivity (i.e., the efficacy of the MMLA to distinguish between effective and ineffective leaders). As the MMLA reflects the trend within leadership assessment to focus on behaviors, a succinct way of testing the instrument’s sensitivity is to assess medical leaders who have already excelled in challenging leadership positions. Additionally, the

MMLA's external validity should be determined by comparing the instrument with other commonly used leadership assessments, including the Army's Multisource Assessment and Feedback (MSAF) and the validated Multifactor Leadership Questionnaire (MLQ) described in Chapter one. The MMLA also should be compared among leadership assessment tools used at the other Federal Service Academies where leadership assessment is commonly linked to service-specific military doctrine (131). Use of the MMLA in the Federal Service Academy system may help leadership development faculty at all six institutions to identify and address gaps with the leadership training. If the instrument is sensitive, valid, and reliable to accurately assess and predict success as a medical leader, then the MMLA also may be a teaching tool to help students and faculty develop into more effective medical leaders. Once psychometric properties are sound, the MMLA might be used to compare students trained at USU versus Health Professions Scholarship Program (HPSP) students – the other major source of physicians for the military.

Research Question 3 (RQ3)

How does expert consensus relate to the FourCe Model of Leadership and transformational leadership theory (TLT)?

RQ3 Results

Discussion of the third research question will center on both the final Delphi Q3 survey, as well as the content generated by the experts with contrast to the FourCe Model and TLT. To frame the discussion in reference to TLT, a visual representation and brief description of the theory is presented below (20)

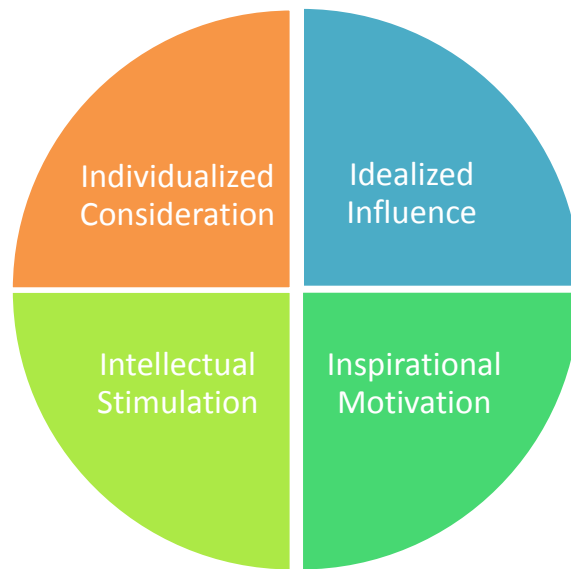


Figure 4: Transformational Leadership Model

Judge (96) offers a brief and useful synopsis of each domain of TLT:

- Individualized Consideration: Attending and supporting the needs of followers.
- Idealized Influence: Being a charismatic role model.
- Intellectual Stimulation: Stimulating creativity and challenging the status quo.
- Inspirational Motivation: Appealing to the motivation of followers by providing a clear vision.

A brief glance of the domains demonstrates a number of items included in the MMLA.

Among these are mentoring others, motivating others, creativity, selflessness, and leading by example. In contrasting with the FourCe model, the greatest number of items were matched with the Character category. The number of items in the Character category highlights how the FourCe model and the MMLA is building on the Transformational Leadership Model, addressing the critique highlighted earlier about charismatic-yet-toxic leaders. Additionally, one of the most important strengths of the FourCe Model and the MMLA is the inclusion of Context,

which is critical in military medicine and is reflected by the definition of military medical leadership also presented in Chapter 1. The definition is presented below for reference:

Military Medical Leadership: *The enhancement of behaviors, cognitions, and emotions/motivations to achieve goals that benefit individuals and groups within the military healthcare system (MHS), foster the health of Warriors and their families, and supports the line Command mission.*

Arguably, each of the 24 items presented in the MMLA could potentially be found within the definition of military medical leadership asserted in this project. In terms of the variety of contexts found within military medicine, the MMLA is distinct. The responsibility to support the Command mission, a facet unique among uniformed physicians, is reflected and assessed in the MMLA more directly than other leadership assessment instruments. While not a primary aim of this project, the MMLA has the potential to develop transformational leadership theories and definitions in an uncertain future for uniformed and civilian medicine.

Additionally, a component of the definition presented above and the MMLA is motivation. The MMLA measures “motivating others” directly, and measures motivation indirectly through “mission focus,” or how a leader manages to motivate subordinates and peers to remain motivated to accomplish difficult or challenging mission.

RQ3 Limitations

As stated above in the discussion of RQ2 limitations, the principle limitation of this project is that it is tied to the FourCe model, which continues to be developed. There are strong links to the more established Transformation Leadership Model (TLM), however, this is only one model of many. Furthermore, leadership theories (including TLM) continue to be critiqued

as lacking sufficient scholarship and empirical evidence (55). Even the process of developing grounded theories of leadership are criticized as focusing too much on the processes between leader and follower, and insufficiently on developing leadership as a distinct and independent natural phenomenon (99). The MMLA, although possessing face and content validity, is limited by the relatively short history of scholarship in leadership development and assessment when compared to the centuries of anecdotal leadership commentary and belief.

RQ3 Future Directions

The MMLA will not settle the important debates of how leadership theory is developed and evaluated. However, the MMLA has the potential to address an important critique from Day and colleagues (55), who argued that insufficient attention has been given to leadership development in favor of literature that is scant on details of developing effective leaders. The MMLA also puts specific details into the FourCe Model of Medical Leadership. While future validation may shift the 24 items from their current category to another, the MMLA enables the FourCe Model to distinguish itself from other leadership models that are vague on specific details. As the MMLA is used to assess and develop individual student physicians and provide a metric of the efficacy of leadership education at USU, so too should the instrument be used to provide valuable grounded evidence to develop existing theories of leadership.

This project was the first step in developing the MMLA which needs to be validated to assess medical leadership. In addition to the next steps described above, the next steps for USU may include using the MMLA in comparison with clerkship evaluations, STEP-1 and STEP-2 scores, class GPA, residency matches, and other more academic assessments widely in use. Similar to currently serving medical leaders who are of a “known quantity” in terms of their

leadership performance, the MMLA should be used to assess and predict those students who take challenging roles and assignments post-graduation.

Implications for Clinical Practice

One of the major drives for the creation of the MMLA was and remains improving the quality of healthcare provided to Warriors and their families. The most direct means that the MMLA accomplishes this is enabling experienced medical educators and leaders to assess the leadership ability of student physicians. The link between improved patient outcomes, patient safety, and effective leadership (especially Transformational Leadership) has been observed in multiple studies and settings (122; 187; 188). Effective leadership has also been linked with improving the social and psychological environments of healthcare settings and the critical interpersonal relationships between physicians and other healthcare professionals (82). A systemic review from Aarons (1) found a link between effective leadership and improved evidence-based practices in mental health settings. Although intended for faculty to evaluate student physicians at USU, the MMLA has potential to be used among numerous healthcare organizations and various professionals to improve the quality of care, patient safety, and patient satisfaction.

Moreover, the MMLA also may be used as a self- or peer assessment instrument. The items and scale do not necessarily require a senior educator or evaluator. In his landmark article describing the nature of the therapeutic alliance in psychotherapy, Ackerman (3) asserted that confidence, effective communication, trustworthiness, and adaptability were all predictive of a healthy therapist-patient alliance. Each of these items are directly evaluated by the MMLA. Ackerman (3) also predicted that warmth and openness as essential parts of the therapeutic alliance, which may arguably be measured by the level of Self-awareness and emotional

intelligence included in the MMLA. The MMLA may be a valuable, brief self-assessment for the healthcare provider who desires to gain more perspective on their skills in building and maintaining a therapeutic alliance. Although the image of a physician caring for a patient may not conjure up images of GEN Washington crossing the icy Delaware River, or LTG (R) Russel Honoré turning the tide for Hurricane Katrina-ravaged New Orleans, the physician's strong character, effective communication, and competence in multiple environments is and will remain a vital component of leadership.

CHAPTER 6: Conclusion

This project used a standard Delphi technique, a structured qualitative communication method, to communicate with a diverse group of leadership experts in order to address three broad questions presented in Chapter 1:

- 1) What do expert and successful leaders believe is important in assessing leadership?
- 2) How would a potential leadership assessment instrument be created from expert consensus and guide leadership education and development in military medicine?
- 3) Can the expert consensus be incorporated into medical education and leadership development?

In addressing the first and second questions, the leadership experts from the initial Delphi panel of experts included 33 leadership experts who represent all branches of the uniformed services, multiple healthcare professions, and civilian community leaders. Analysis of the panel's responses and subsequent refinement from the project's coding team and a cognitive interview of 15 healthcare educators created an assessment instrument of 24 items and criteria measured by a behavior-based frequency scale. The resulting instrument, called the Military Medical Leadership Assessment (MMLA), is a brief, 3 page assessment that may be used by USU faculty, student peers, and as a self-assessment. This project was the first step in the creation of the MMLA, which requires formal validation in future studies.

Addressing the third question about expert consensus integrated within medical education and leadership development, The MMLA is especially designed to be integrated within the USU Leadership Education and Development (LEAD) and develop the USU FourCe Model of Medical Leadership. In addition to providing useful feedback on student physician performance and the efficacy of the leadership development program at USU, the instrument should also be

used to provide data to advance and improve existing models of medical leadership, as well as compare leadership competency of USU medical students with their peers at civilian institutions.

The MMLA is the first Joint-Service assessment that is face and content valid specifically designed to provide feedback for leaders within the Military Healthcare System (MHS). In the future, the MMLA should be formally evaluated for criterion and construct validity among students at USU and leadership development programs throughout the MHS.

REFERENCES

1. Aarons G. 2006. Transformational and transactional leadership: Association with attitudes toward evidence-based practice. *Psychiatric Services* 57:1162-1169
2. Abcarian R, Powers A, Meyer J. 2009. Army psychiatrist blamed in Fort Hood shooting rampage. *Los Angeles Times*:1-3
3. Ackerman S, Hilsenroth M. 2003. A review of therapist characteristics and techniques positively impacting the therapeutic alliance. *Clinical Psychology Review* 23:1-33
4. Adler M, Ziglio E. 1996. *Gazing into the Oracle: the Delphi Method and its Application to Social Policy and Public Health*. New York: Jessica Kingsley Publishers
5. Akins R, Cole B. 2005. Barriers to implementation of patient safety systems in healthcare institutions: leadership and policy implications. *Journal of Patient Safety* 1:9-16
6. Andersen J. 2006. Leadership, personality and effectiveness. *The Journal of Socio-Economics* 35:1078-1091
7. Ardichvili A, Mitchell J, Jondle D. 2009. Characteristics of ethical business cultures. *Journal of Business Ethics* 85:445-451
8. Asch S. 1951. Effects of group pressure upon the modification and distortion of judgments. *Groups, Leadership, and Men*. S:222-236
9. Attride-Stirling J. 2001. Thematic networks: an analytic tool for qualitative research. *Qualitative Research* 1:385-405
10. Aude S, Mitchell D, Cordes G. Development and validation of leadership assessment instruments for United States Army commanders, staff officers, and non-commissioned officers (NCOs). *Proc. 46th International Military Testing Association Annual Conference*, 2005
11. Avolio B, Gardner W. 2005. Authentic leadership development: Getting to the root of positive forms of leadership. *The Leadership Quarterly* 16:315-338
12. Bäck-Pettersson S, Hermansson E, Sernert N, Björkelund C. 2008. Research priorities in nursing—a Delphi study among Swedish nurses. *Journal of Clinical Nursing* 17:2221-2231
13. Bakeless J. 1998. *Turncoats, Traitors, and Heroes*. New Jersey: Da Capo Press
14. Baker J, Lovell K, Harris N. 2006. How expert are the experts? An exploration of the concept of ‘expert’ within Delphi panel techniques. *Nurse Researcher* 14:59-70
15. Baker K. 2011. The Effect of Post Traumatic Stress Disorder on Military Leadership: An Historical Perspective, Defense Technical Information Center (DTIC) Document

16. Balasubramanian R, Agarwal D. 2013. Delphi Technique-A Review. *International Journal of Public Health Dentistry* 3:16-25
17. Barbour R. 2001. Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *British Medical Journal* 322:1115-1117
18. Bartone P. 2006. Resilience under military operational stress: Can leaders influence hardiness? *Military Psychology* 18:S131-S148
19. Bass B. 1985. *Leadership and Performance Beyond Expectations*. New York: Free Press
20. Bass B, Avolio B. 1994. *Improving Organizational Effectiveness through Transformational Leadership*. Thousand Oaks, CA: Sage Publications
21. Bass B, Avolio B. 1997. *Full Range Leadership Development: Manual for the Multifactor Leadership Questionnaire*. Mind Garden Palo Alto, CA
22. Bass B, Avolio B, Jung D, Berson Y. 2003. Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology* 88:207
23. Baumrind D. 1971. Current patterns of parental authority. *Developmental Psychology* 4:1
24. Bayley E, MacLean S, Desy P, McMahon M. 2004. ENA's Delphi study on national research priorities for emergency nurses in the United States. *Journal of Emergency Nursing* 30:12-21
25. Beatty P, Willis G. 2007. Research synthesis: The practice of cognitive interviewing. *Public Opinion Quarterly* 71:287-311
26. Bennis W. 1959. Leadership theory and administrative behavior: The problem of authority. *Administrative Science Quarterly* 4:259-301
27. Best R. 2005. Military medical care services: Questions and answers: Defense Technical Information Center (DTIC) Document
28. Blackmore J. 1989. Educational leadership: A feminist critique and reconstruction. *Critical Perspectives on Educational Leadership* 2:93-129
29. Blake R, Mouton J. 1981. Management by Grid® principles or situationalism: Which? *Group & Organization Management* 6:439-55
30. Blanchard K, Zigarmi D, Nelson RB. 1993. Situational Leadership® after 25 years: A retrospective. *Journal of Leadership & Organizational Studies* 1:21-36
31. Blumenthal D, Bernard K, Bohnen J, Bohmer R. 2012. Addressing the leadership gap in medicine: residents' need for systematic leadership development training. *Academic Medicine* 87:513-22

32. Board D. 2007. *Future of Military Healthcare*. Washington, D.C.: Department of Defense
33. Boulkedid R, Abdoul H, Loustau M, Sibony O, Alberti C. 2011. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *Public Library of Science One* 6:20-47
34. Brolin E. 1997. Assessment Centers Applicability to the Development and Selection of Leaders in the Acquisition Career Field: Defense Technical Information Center (DTIC) Document
35. Bryman A. 2006. Integrating quantitative and qualitative research: how is it done? *Qualitative Research* 6:97-113
36. Buchanan D, Fitzgerald L, Ketley D, Gollop R, Jones JL, et al. 2005. No going back: a review of the literature on sustaining organizational change. *International Journal of Management Reviews* 7:189-205
37. Burnes B. 2004. Kurt Lewin and complexity theories: back to the future? *Journal of Change Management* 4:309-25
38. Burnes B. 2004. Kurt Lewin and the planned approach to change: A re-appraisal. *Journal of Management Studies* 41:977-1002
39. Burns G. 1978. *The Principles of Leadership*. San Antonio, TX: Our Lady of the Lake Publishing
40. Burton L, Mazerolle S. 2011. Survey instrument validity part I: Principles of survey instrument development and validation in athletic training education research. *Athletic Training Education Journal* 6:27-35
41. Calhoun J, Dollett L, Sinioris M, Wainio J, Butler P. 2008. Development of an interprofessional competency model for healthcare leadership. *Journal of Healthcare Management* 53:375-389
42. Carrington N. 2012. *Females and Toxic Leadership* Defense Technical Information Center (DTIC) Document
43. Carroll T. 2005. Leadership skills and attributes of women and nurse executives: challenges for the 21st century. *Nursing Administration Quarterly* 29:146-53
44. Cartwright D, Zander A. 1968. Leadership and performance of group functions: Introduction. *Group Dynamics: Research and Theory* 3:301-319
45. Chadi N. 2009. Medical leadership: doctors at the helm of change. *McGill Journal of Medicine* 12:52-57

46. Christensen E, Farr C, Grefer J, Schaefer E. 2006. *Cost Implications of a Unified Medical Command*. Virginia: CNA Press
47. Clay-Williams R, Braithwaite J. 2009. Determination of health-care teamwork training competencies: a Delphi study. *International Journal for Quality in Health Care* 21:433-40
48. Cohen S. 1988. Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychology* 7:269-297
49. Congress of the United States. 2003. Congressional Record, January 7, 2003 to January 17, 2003. p. 132. Washington, DC: Government Printing Office
50. Corley K. 2011. The coming of age for qualitative research: Embracing the diversity of qualitative methods. *Academy of Management Journal* 54:233-7
51. Creswell J. 2013. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. New York: Sage Publications
52. Cunliffe A, Eriksen M. 2011. Relational leadership. *Human Relations* 64:1425-49
53. Czinkota M, Ronkainen I. 1997. International business and trade in the next decade: Report from a Delphi study. *Journal of International Business Studies*:28:827-44
54. Dalkey N, Helmer O. 1963. An experimental application of the Delphi method to the use of experts. *Management Science* 9:458-67
55. Day D, Fleenor J, Atwater L, Sturm R, McKee R. 2014. Advances in leader and leadership development: A review of 25 years of research and theory. *The Leadership Quarterly* 25:63-82
56. De Meyrick J. 2003. The Delphi method and health research. *Health Education* 103:7-16
57. Dennis R, Bocarnea M. 2005. Development of the servant leadership assessment instrument. *Leadership & Organization Development Journal* 26:600-15
58. Di Schiena R, Letens G, Van Aken E, Farris J. 2013. Relationship between Leadership and Characteristics of Learning Organizations in Deployed Military Units: An Exploratory Study. *Administrative Sciences* 3:143-65
59. Dion K. 2000. Group cohesion: From "field of forces" to multidimensional construct. *Group Dynamics: Theory, Research, and Practice* 4:7-26
60. Department of Defense. 2010. Protecting the Force: Lessons From Fort Hood. Washington, DC: US Department of Defense
61. Dorrance K, Ramchandani S, LaRochelle J, Mael F, Lynch S, Grundy P. 2013. Protecting the culture of a patient-centered medical home. *Military Medicine* 178:153-8

62. Doty J, Fenlason J. 2013. Narcissism and Toxic Leaders Defense Technical Information Center (DTIC) Document
63. Dreikurs R. 1949. Counseling for family adjustment. *Individual Psychology Bulletin*. 7:119-137
64. Dreikurs R. 1951. The unique social climate experienced in group psychotherapy. *Group Psychotherapy* New York: Guilford Press.
65. Dreikurs R. 1957. *Psychology in the Classroom: A Manual for Teachers* Chicago, IL: University of Chicago Press.
66. Eagly A, Carli L. 2003. The female leadership advantage: An evaluation of the evidence. *The Leadership Quarterly* 14:807-34
67. Eagly A, Johnson B. 1990. Gender and leadership style: A meta-analysis. *Psychological Bulletin* 108:233-256
68. Engel G. 1980. The clinical application of the biopsychosocial model. *American Journal of Psychiatry* 137:535-44
69. Erikson E. 1950. *Childhood and Society*. New York: W.W. Norton
70. Ferguson E. 2004. The 2003 HL and RR Ansbacher Memorial Address: Democratic relationships: Key to Adlerian concepts. *The Journal of Individual Psychology* 60:3-24
71. Ferguson E, Hagaman J, Grice J, Peng K. 2006. From leadership to parenthood: The applicability of leadership styles to parenting styles. *Group Dynamics: Theory, Research, and Practice* 10:43-55
72. Ford L, Seers A, Neumann J. 2013. Honoring complexity: Set-theoretic analysis as a complementary method in leadership research. *Management Research Review* 36:644-63
73. French A. 1968. *General Gage's Informers*. New Jersey: Scholar's Bookshelf
74. Furnham A, Stringfield P. 1998. Congruence in job-performance ratings: A study of 360 feedback examining self, manager, peers, and consultant ratings. *Human Relations* 51:517-30
75. Glaser B, Strauss A, Strutzel E. 1967. *The Discovery of Grounded Theory; Strategies for Qualitative Research*. New York: Aldine Publishers
76. Godfrey L. 2001. A Unified Medical Command: The Next Step in Joint Warfare Development: Defense Technical Information Center (DTIC) Document
77. Graham B, Regehr G, Wright J. 2003. Delphi as a method to establish consensus for diagnostic criteria. *Journal of Clinical Epidemiology* 56:1150-6
78. Greenleaf R. 1977. *Servant Leadership*. New York: Paulist Press

79. Greenwood J, Berry F. 2005. *Medics at War: Military Medicine from Colonial Times to the 21st Century*. Annapolis: Naval Institute Press
80. Callahan C. , Grunberg N. 2014. Military medical leadership. In *Textbook of Military Medicine* ed. O'Connor F, Schoomaker E, Smith D.: In press.
81. Grunberg N, Schoomaker E. 2014. Personal communication with the author
82. Gunnarsdóttir S, Clarke S, Rafferty A, Nutbeam D. 2009. Front-line management, staffing and nurse–doctor relationships as predictors of nurse and patient outcomes. A survey of Icelandic hospital nurses. *International Journal of Nursing Studies* 46:920-927
83. Halal W, Kull M, Leffmann A. 1997. Emerging technologies: What’s ahead for 2001-2030. Scholars assemble a comprehensive forecast of coming technologies. *The Futurist* 31:20-28
84. Hardy C, Leiba-O'Sullivan S. 1998. The power behind empowerment: Implications for research and practice. *Human Relations* 51:451-483
85. Hardy L, Arthur C, Jones G, Shariff A, Munnoch K. 2010. The relationship between transformational leadership behaviors, psychological, and training outcomes in elite military recruits. *The Leadership Quarterly* 21:20-32
86. Hill K, Fowles J. 1975. The methodological worth of the Delphi forecasting technique. *Technological Forecasting and Social Change* 7:179-192
87. Horey J, Fallesen J, Morath R, Cronin B, Cassella R. 2004. Competency based future leadership requirements: Defense Technical Information Center (DTIC) Document
88. Horey J, Harvey J, Curtin P, Keller-Glaze H, Morath R, Fallesen J. 2007. A criterion-related validation study of the Army core leader competency model: Defense Technical Information Center (DTIC) Document
89. Hosek S, Cecchine G. 2001. *Reorganizing the Military Health System*. Virginia: Rand Corporation Publishing
90. House J, Landis K, Umberson D. 1988. Social relationships and health. *Science* 241:540-545
91. Hsu C, Sandford B. 2007. The Delphi technique: making sense of consensus. *Practical Assessment, Research & Evaluation* 12:1-8
92. Hull A. 2007. Hospital officials knew of neglect. *Washington Post*
93. Irving J, Longbotham G. 2007. Team effectiveness and six essential servant leadership themes: A regression model based on items in the organizational leadership assessment. *International Journal of Leadership Studies* 2:98-113

94. Jansen D. 2014. Military medical care: Questions and answers: Congressional Research Service, Washington D.C.
95. Janz N, Becker M. 1984. The health belief model: A decade later. *Health Education & Behavior* 11:1-47
96. Judge T, Bono J. 2000. Five-factor model of personality and transformational leadership. *Journal of Applied Psychology* 85:751-765
97. Judge T, Bono J, Ilies R, Gerhardt M. 2002. Personality and leadership: a qualitative and quantitative review. *Journal of Applied Psychology* 87:765-780
98. Keeney S, Hasson F, McKenna H. 2006. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *Journal of Advanced Nursing* 53:205-212
99. Kempster S, Parry K. 2011. Grounded theory and leadership research: A critical realist perspective. *The Leadership Quarterly* 22:106-120
100. Kennedy K. 2007. Walter Reed patients told to keep quiet. *Navy Times*
101. Khoo H, Burch G. 2008. The 'dark side' of leadership personality and transformational leadership: An exploratory study. *Personality and Individual Differences* 44:86-97
102. Kippenberger T. 1998. Planned change: Kurt Lewin's legacy. *Antidote* 3:10-12
103. Kirby S, Marsh J, McCombs J, Thie H, Xia N, Sollinger J. 2011. *Developing Military Health Care Leaders: Insights from the Military, Civilian, and Government Sectors*, Washington, D.C.: Center for Military Health Policy Research
104. Kluger A, DeNisi A. 1996. The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin* 119:254-284
105. Komives S, Lucas N, McMahon T. 2009. *Exploring Leadership: For College Students Who Want to Make a Difference*. New York: John Wiley & Sons
106. Kull S, Leatherman M, Smith R. 2012. Consulting the American People on National Defense Spending: The Center on Policy Attitudes School of Public Policy, University of Maryland
107. Lee T. 2010. Turning doctors into leaders. *Harvard Business Review* 88:50-58
108. Lewin K. 1939. Field theory and experiment in social psychology: Concepts and methods. *American Journal of Sociology*:868-896
109. Lewin K. 1947. Frontiers in group dynamics II. Channels of group life; social planning and action research. *Human Relations* 1:143-153

110. Lewin K, Lippitt R, White R. 1939. Patterns of aggressive behavior in experimentally created "social climates". *The Journal of Social Psychology* 10:269-299
111. Lewin M. 1987. Kurt Lewin and the invisible bird on the flagpole: A reply to Graebner. *Journal of Social Issues* 43:123-139
112. Lieberman J. 2011. *Ticking Time Bomb: Counter-Terrorism Lessons from the US Government's Failure to Prevent the Fort Hood Attack*. Pennsylvania: Diane Publishing
113. Linstone H, Turoff M. 1975. *The Delphi method: Techniques and Applications*. Reading, Massachusettes: Addison-Wesley
114. London M, Smither J. 2002. Feedback orientation, feedback culture, and the longitudinal performance management process. *Human Resource Management Review* 12:81-100
115. Lossing B. 1872. *The American Historical Record, and Repertory of Notes and Queries: Concerning the History and Antiquities of America and Biography of Americans*. New Jersey: Chase & Town
116. Lutz A. 2008. Who joins the military?: A look at race, class, and immigration status. *Journal of Political and Military Sociology* 36:167-188
117. Mangelsdorff A, Finstuen K, Rogers J. 1999. Forecast For Success-US Army Medical Service Corps Officers: Defense Technical Information Center (DTIC) Document
118. Mangelsdorff A, Rogers J, Zucker K, Thieschafer C, Hagen J, Finstuen K. 1997. Vision 21 Delphi panel: senior Army Medical Service Corps Officers' vision of behaviors for success of future Medical Service Corps officers. *Military Medicine* 162:450-452
119. Marshall C, Rossman GB. 2010. *Designing Qualitative Research*. New York: Sage
120. Matthews M. 2015. Personal Communication with author
121. Mawhinney D. 1990. Analysis of: A Military Leadership Assessment Development Program: Defense Technical Information Center (DTIC) Document
122. McFadden K, Henagan S, Gowen C. 2009. The patient safety chain: Transformational leadership's effect on patient safety culture, initiatives, and outcomes. *Journal of Operations Management* 27:390-404
123. Mcilpatrick S, Keeney S. 2003. Identifying cancer nursing research priorities using the Delphi technique. *Journal of Advanced Nursing* 42:629-636
124. McKinley J. 2009. Second officer gives an account of the shooting at Ft. Hood. *The New York Times*

125. Meadows A, Finstuen K, Hudak R. 2002. Pharmacy executives: leadership issues and associated skills, knowledge, and abilities in the US Department of Defense. *Journal of the American Pharmacists Association* 43:412-418
126. Meyer E. 2012. Developing military cultural competency in health care providers. *Academic Medicine* 87:1-3
127. Meyer J, Bill B, Berrigan M, Boehman U, Caldwell M. 2002. *Operational Law Handbook*. Charlottesville, Va: International and Operational Law Department, The Judge Advocate General's School
128. Miller B. 1986. *The "Bhagavad-Gita": Krishna's Counsel in Time of War*. New York: Bantam
129. Montano D, Kasprzyk D. 2008. Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health Behavior and Health Education: Theory, research, and practice* 4:67-95
130. Moody J, White D. 2002. Social cohesion and embeddedness: A hierarchical conception of social groups. *Sociological Methodology*:365-368
131. Moore B. 2015. Personal Communication with author
132. Moores L, Callahan C. 2013. The US Army Medical Corps Leadership 4 Development Program *The United States Army Medical Journal* July-September 2013: 4-30
133. Muenjohn N, Armstrong A. 2008. Evaluating the structural validity of the Multifactor Leadership Questionnaire (MLQ), capturing the leadership factors of transformational-transactional leadership. *Contemporary Management Research* 4:3-14.
134. Mumford M, Zaccaro S, Harding F, Jacobs T, Fleishman E. 2000. Leadership skills for a changing world: Solving complex social problems. *The Leadership Quarterly* 11:11-35
135. Murphy D. 2009. Fort Hood shooting: Was Nidal Malik Hasan inspired by militant cleric? *Christian Science Monitor*
136. O'Connor F, Grunberg N, Schoomaker E. 2014. Leadership education and development (LEAD) program at the Uniformed Services University. *Military Medicine* 4:147
137. Office of the Congressional Budget. 2014. *Approaches to Reducing Federal Spending on Military Health Care* Washington D.C.: Government Printing Office
138. Okoli C, Pawlowski S. 2004. The Delphi method as a research tool: an example, design considerations and applications. *Information & Management* 42:15-29
139. Orlander J, Wipf J, Lew R. 2009. Development of a tool to assess the team leadership skills of medical residents. *Medical Education Online* 11:1-6

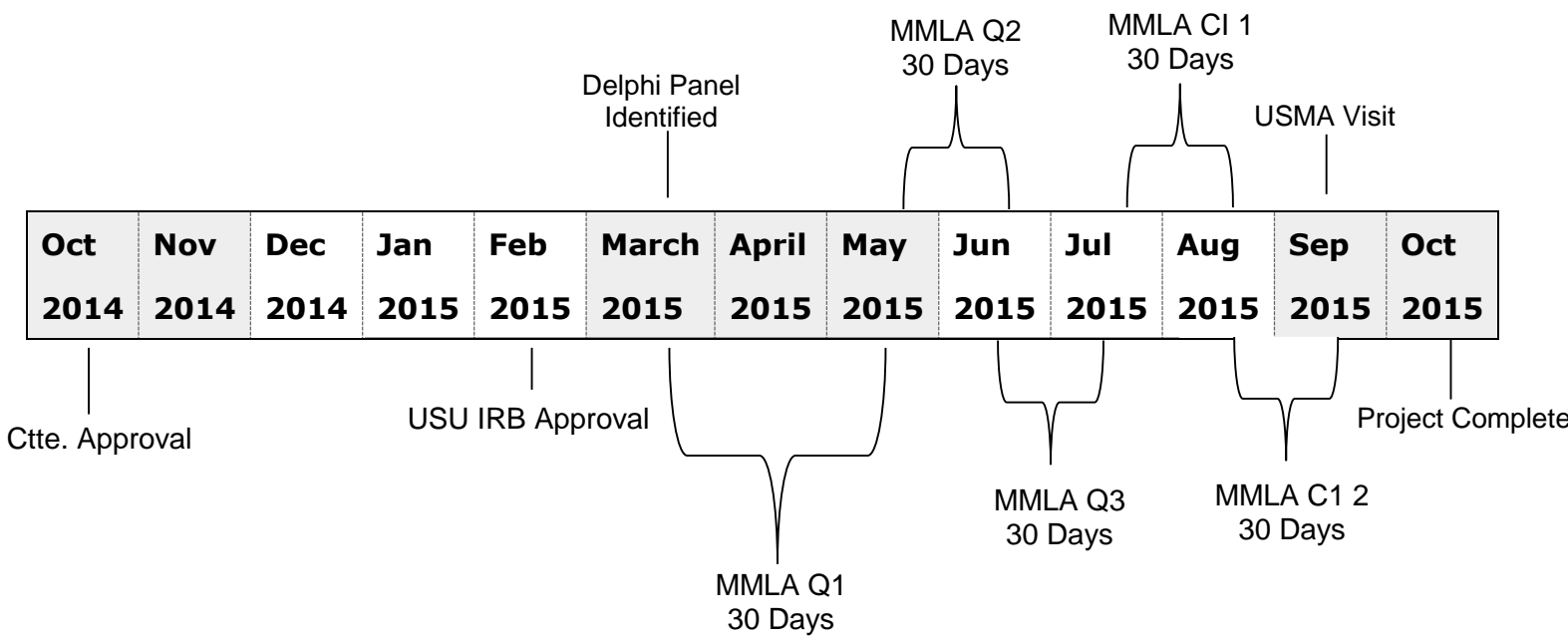
140. Paciorek J, Karras J. 2003. Medicine and its Practice During the American Civil War. *The College of New Jersey Journal of Student Scholarship* 9:1-12
141. Palarca C, Johnson S, Mangelsdorff A, Finstuen K. 2008. Building from within: identifying leadership competencies for future navy nurse executives. *Nursing Administration Quarterly* 32:216-25
142. Pappamihel C, Pappamihel E. 2012. Cultural self-awareness as a crucial component of military cross-cultural competence. *Journal of Special Operations Medicine* 13:62-69
143. Parker W. 1976. Black-white differences in leader behavior related to subordinates' reactions. *Journal of Applied Psychology* 61:140-147
144. Patrick D, Burke L, Gwaltney C, Leidy N, Martin M. 2011. Content validity—establishing and reporting the evidence in newly developed patient-reported outcomes (PRO) instruments for medical product evaluation: ISPOR PRO Good Research Practices Task Force report: part 2—assessing respondent understanding. *Value in Health* 14:978-988
145. Patterson K. 2003. *Servant Leadership: A Theoretical Model*. Virginia: Regent University Press
146. Patton M. 2005. *Qualitative Research*. Wiley Online Library
147. Peters A. 2000. Vision 2005: A forecast of executive leadership skills and associated competencies required by navy dental corps officers into the 21st century: Defense Technical Information Center (DTIC) Document
148. Peterson R. 1997. A directive leadership style in group decision making can be both virtue and vice: Evidence from elite and experimental groups. *Journal of Personality and Social Psychology* 72:1107-1121
149. Philpot T. 2011. Services split over push for unified medical command. *Stars and Stripes*
150. Pololi L, Conrad P, Knight S, Carr P. 2009. A study of the relational aspects of the culture of academic medicine. *Academic Medicine* 84:106-114
151. Powell K. 2011. Framing Islam: An analysis of US media coverage of terrorism since 9/11. *Communication Studies* 62:90-112
152. Procheska J, Diclemante C. 1983. Stage of processes of self change of smoking: Toward an integrative model. *Journal of Consulting and Clinical Psychology* 56:520-528
153. Reed G, Olsen R. 2010. Toxic leadership: Part deux: Defense Technical Information Center (DTIC) Document
154. Rice C. 2012. 2012 Annual Report 40th Anniversary Edition, Uniformed Services University, Bethesda, MD

155. Rice C. 2014. Uniformed Services University Strategic Framework: 2014-2018, Uniformed Services University, Bethesda, MD
156. Ricks T, Ann S. 2007. Defense Secretary Sends Stern Message About Accountability. *Washington Post*
157. Rowe G, Wright G. 1999. The Delphi technique as a forecasting tool: issues and analysis. *International Journal of Forecasting* 15:353-375
158. Schmidt A. 2008. *Development and validation of the toxic leadership scale*. ProQuest Online
159. Schmidt R. 1997. Managing Delphi surveys using nonparametric statistical techniques. *Decision Sciences* 28:763-774
160. Schoomaker E, Green-Dixon A, Callahan C. 2015. Personal Communication with the author
161. Schwartz R, McManus J, Croushorn J, Piazza G, Coule P. 2011. Tactical medicine: Competency-based guidelines. *Prehospital Emergency Care* 15:67-82
162. Sentell J. 1996. Executive skills 21: A forecast of leadership skills and associated competencies required by naval hospital administrators into the 21st century: Defense Technical Information Center (DTIC) Document
163. Shearer B. 2006. *Home Front Heroes*. Connecticut: Greenwood Publishing Group
164. Silverstein L, Auerbach C. 2007. Qualitative research: Bridging the gap between science and practice. *New York State Psychologist* 19:30-33
165. Skulmoski G, Hartman F. 2002. The Delphi method: Researching what does not exist (yet). *Proc. Proceedings of the International Research Network on organization by projects, IRNOP V Conference, Renesse, the Netherlands, 2002*
166. Skulmoski G, Hartman F, Krahn J. 2007. The Delphi method for graduate research. *Journal of Information Technology Education: Research* 6:1-21
167. Smith A, Lane D, Zimble J. 2007. Purple Medicine: The Case for a Joint Medical Command: Defense Technical Information Center (DTIC) Document
168. Souba W. 2004. New ways of understanding and accomplishing leadership in academic medicine. *Journal of Surgical Research* 117:177-186
169. Steele J. 2011. Antecedents and consequences of toxic leadership in the US Army: A two year review and recommended solutions: Defense Technical Information Center (DTIC) Document

170. Stogdill RM. 1948. Personal factors associated with leadership: A survey of the literature. *The Journal of psychology* 25:35-71
171. Stogdill R. 1950. Leadership, membership and organization. *Psychological Bulletin* 47:1-14
172. Tejada M, Scandura T, Pillai R. 2001. The MLQ revisited: Psychometric properties and recommendations. *The Leadership Quarterly* 12:31-52
173. Testa M. 2002. A model for organization-based 360 degree leadership assessment. *Leadership & Organization Development Journal* 23:260-268
174. Toegel G, Conger J. 2003. 360-degree assessment: Time for reinvention. *Academy of Management Learning & Education* 2:297-311
175. Tracey J, Hinkin T. 1998. Transformational leadership or effective managerial practices? *Group & Organization Management* 23:220-236
176. Tuckman B. 1965. Developmental sequence in small groups. *Psychological Bulletin* 63:384-399
177. Ulschak F. 1983. *Human Resource Development: The Theory and Practice of Need Assessment*. Virginia: Reston Publishing Company
178. Van Emmerik I, Euwema M, Wendt H. 2008. Leadership behaviors around the world the relative importance of gender versus cultural background. *International Journal of Cross Cultural Management* 8:297-315
179. Vanderburg K. 2003. Aeromedical evacuation: A historical perspective. In *Aeromedical Evacuation* New York: Springer
180. Waldman D, Atwater L, Antonioni D. 1998. Has 360 degree feedback gone amok? *The Academy of Management Executive* 12:86-94
181. Weberg D. 2010. Transformational leadership and staff retention: an evidence review with implications for healthcare systems. *Nursing Administration Quarterly* 34:246-58
182. Whitehouse A, Hassell A, Bullock A, Wood L, Wall D. 2007. 360 degree assessment (multisource feedback) of UK trainee doctors: Field testing of team assessment of behaviours (TAB). *Medical Teacher* 29:171-176
183. Williams D. 2005. Toxic leadership in the US Army: Defense Technical Information Center (DTIC) Document
184. Willis G. 1999. Cognitive interviewing: A "how to" guide. *Proc. meeting of the American Statistical Association, 1999*

185. Willis G. 2004. *Cognitive Interviewing: A Tool for Improving Questionnaire Design*. New York: Sage Publications
186. Winston B, Patterson K. 2006. An integrative definition of leadership. *International Journal of Leadership Studies* 1:6-66
187. Wong C, Cummings G. 2007. The relationship between nursing leadership and patient outcomes: a systematic review. *Journal of Nursing Management* 15:508-21
188. Wong C, Cummings G, Ducharme L. 2013. The relationship between nursing leadership and patient outcomes: a systematic review update. *Journal of Nursing Management* 21:709-724
189. Xirasagar S, Samuels M, Stoskopf C. 2005. Physician leadership styles and effectiveness: an empirical study. *Medical Care Research and Review* 62:720-740
190. Yalom I. 1995. *The Theory and Practice of Group Psychotherapy*. Los Angeles: Basic Books
191. Yousuf M. 2007. Delphi Technique. *Essays in Education* 20:80-89
192. Zaccaro S, Klimoski R, Boyce L, Chandler C, Banks D. 1999. Developing a tool kit for the assessment of Army leadership processes and outcomes: Version 1.0: Defense Technical Information Center (DTIC) Document

APPENDIX A: Project Timeline



APPENDIX B: Study Surveys



UNIFORMED SERVICES UNIVERSITY
of the Health Sciences

MMLA Q1

Demographics

Please tell us a little about yourself

1. Are you male or female?

☐ Female

☐ Male

2. What is your age?

☐ 17 or younger

☐ 18-20

☐ 21-29

☐ 30-39

☐ 40-49

☐ 50-59

☐ 60 or older

3. What is the highest level of school you have completed or the highest degree you have received?

- ☐ High school degree or equivalent (e.g., GED)
- ☐ Some college but no degree
- ☐ Associate degree
- ☐ Bachelor degree
- ☐ Master's degree
- ☐ Doctor of Medicine/ Doctor of Osteopathy (MD/DO)
- ☐ Doctor of Philosophy (PhD)
- ☐ Other Professional Doctorate (DNP, PsyD, OD, PharmD)
- ☐ Other (please specify)

4. Are you White, Black or African-American, American Indian or Alaskan Native, Asian, Native Hawaiian or other Pacific islander, or some other race?

- ☐ White
- ☐ Black or African-American
- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ From multiple races

Some other race (please specify)

5. Are you Mexican-American, Chicano, Puerto Rican, Cuban-American, or some other Spanish, Hispanic, or Latino group?

- ☐ I am not Spanish, Hispanic, or Latino
- ☐ Mexican-American
- ☐ Chicano
- ☐ Puerto Rican
- ☐ Cuban-American
- ☐ Some other Spanish, Hispanic, or Latino group
- ☐ From multiple Spanish, Hispanic, or Latino groups

6. Which branch of uniformed service have you served or are currently serving?

- ☐ Army
- ☐ Marine Corps
- ☐ Navy
- ☐ Air Force
- ☐ Coast Guard
- ☐ Public Health Service
- ☐ N/A (Civilian)

7. What best describes your medical or professional specialty?

- ☐ Physician
- ☐ Dentist
- ☐ Nurse
- ☐ Healthcare Admin (Uniformed)
- ☐ Healthcare Admin (Civilian)
- ☐ Doctoral-level non-physician provider (OD, PT, PhD/PsyD)
- ☐ Other non-physician provider (PA, RD)
- ☐ Military Line Commander (Non-Medical)
- ☐ Non-Commissioned Officer (NCO) - Medical
- ☐ Non-Commissioned Officer (NCO) - Non-Medical
- ☐ Other (please specify)

8. Please select your highest uniformed rank achieved

- ☐ E1-E6
- ☐ E7-E9
- ☐ O1-O3
- ☐ O4-O5
- ☐ O6
- ☐ O7-O9
- ☐ N/A (Civilian)

MMLA Q1**Leadership**

Please tell us about your leadership experience(s) and what you think

9. Briefly, please describe your leadership experience(s) to the present day

10. In the box below, please list any terms, concepts, or ideas you believe are important to developing medical leadership skills in uniformed medical students

Thank you for your responses. Once the responses from other experts are collected, another questionnaire will be emailed to you for further input



MMLA Q2

Survey 2: Rating Importance

Please review the following terms that have been generated by you and other experts and rate their importance in teaching and assessing leadership to uniformed medical students. Thank you for your participation.

1. How important are the following terms & phrases?

	Not Important	Slightly Important	Somewhat Important	Moderately Important	Very Important
Accountability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowing the Chain of Command	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial Responsibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risk Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral Communication Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Actively Participating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energizing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empowering Others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delegating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leading by Example	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivating Others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q2

Page 2

2. How important are the following terms & phrases?

	Not Important	Slightly Important	Somewhat Important	Moderately Important	Very Important
Sponsorship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serving Others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem Solving Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decision Making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prioritizing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Considering Perspectives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thinking Strategically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Balancing Priorities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self Awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remain Calm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Strength	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q2

Page 3

3. How important are the following terms & phrases?

	Not Important	Slightly Important	Somewhat Important	Moderately Important	Very Important
Conflict Resolution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operational Astuteness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural Competency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keeping Skills Current	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mission Focus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tactical Combat Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding Teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding Service History	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding Mental Trauma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Authenticity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loyalty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organizational Values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q2

Page 4

4. How important are the following terms & phrases?

	Not Important	Slightly Important	Somewhat Important	Moderately Important	Very Important
Command Presence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Integrity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dedication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empathy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kindness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Restraint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Showing Vulnerability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selflessness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excellence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal Values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Responsibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q2

Page 5

5. How important are the following terms & phrases?

	Not Important	Slightly Important	Somewhat Important	Moderately Important	Very Important
Physical Attractiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Charisma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Popularity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Valorous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religiousness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hard Working	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family Values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q3

Page 1

This will be the final survey you will be asked to complete. Below are 30 items that you and other experts have identified as moderately important to very important. Please categorize these items into one of four major categories: Competence; Communication; Character; Context. Some items may fit into more than one category; please choose the one category that best describes the item. Thank you for your valuable input.

1. Which Category Best Describes the Following Terms?

	Competence	Communication	Character	Context
Accountability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem Solving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decision Making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Valor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q3

Page 2

2. Which Category Best Describes the Following Terms?

	Competence	Communication	Character	Context
Oral Communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-Verbal Communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written Communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leading by Example	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selflessness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Integrity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



MMLA Q3

Page 3

3. Which Category Best Describes the Following Terms?

	Competence	Communication	Character	Context
Responsibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Charismatic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflict Resolution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mission Focus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adapting to different environments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural Sensitivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Popularity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

MMLA CI1**Welcome Page**

Each of the items listed in this survey will be used in an assessment of uniformed medical leadership.

There are 25 items each on a separate page. Please rate each item for clarity and offer any suggestions to make the item more clear.

Click below to begin the survey.

Thank you.



MMLA CI1

Item 1: Please assess the Question Below

"How often does the rated student demonstrate problem solving skills?"

1. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

2. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 2: Please Assess The Question Below

"How often does the rated student practice effective time management?"

3. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

4. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 3: Please Assess The Question Below

"How often does the rated student demonstrate effective decision making?"

5. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

6. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 4: Please Assess The Question Below

"How often does the rated student continues to learn?"

7. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

8. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 5: Please Assess the Question Below

"How often does the rated student remain focused on the mission?"

9. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

10. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 6: Please Assess the Question Below

"How often does the rated student demonstrates effective oral communication?"

11. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

12. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 7: Please Assess the Question Below

"How often does the rated student demonstrates effective non-verbal communication?"

13. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

14. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 8: Please Assess the Question Below

"How often does the rated student demonstrates effective written communication?"

15. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

16. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 9: Please Assess the Question Below

"How often does the rated student demonstrates effective listening skills?"

17. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

18. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 10: Please Assess the Question Below

"How often does the rated student collaborates with others?"

19. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

20. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 11: Please Assess the Question Below

"How often does the rated student motivates others?"

21. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

22. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 12: Please Assess the Question Below

"How often does the rated student mentors others?"

23. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

24. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 13: Please Assess the Question Below

"How often does the rated student demonstrates accountability?"

25. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

26. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 14: Please Assess the Question Below

"How often does the rated student demonstrate a high level of emotional intelligence?"

27. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

28. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 15: Please Assess the Question Below

"How often does the rated student leads by example?"

29. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

30. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 16: Please Assess the Question Below

"How often does the rated student demonstrates selflessness?"

31. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

32. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 17: Please Assess the Question Below

"How often does the rated student demonstrates self-awareness?"

33. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

34. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 18: Please Assess the Question Below

"How often does the rated student displays patience?"

35. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

36. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 19: Please Assess the Question Below

"How often does the rated student demonstrates a adaptability?"

37. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

38. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 20: Please Assess the Question Below

"How often does the rated student shows integrity?"

39. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

40. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 21: Please Assess the Question Below

"How often does the rated student takes responsibility?"

41. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

42. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 22: Please Assess the Question Below

"How often does the rated student displays confidence?"

43. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

44. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 23: Please Assess the Question Below

"How often does the rated student shows creativity?"

45. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

46. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 24: Please Assess the Question Below

"How often does the rated student adapts to different environments?"

47. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

48. Please add any comments that you feel would improve the quality of the question



MMLA C11

Item 25: Please Assess the Question Below

"How often does the rated student shows cultural sensitivity?"

49. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

50. Please add any comments that you feel would improve the quality of the question



MMLA CI2

Welcome Page

Each of the items presented in this survey have incorporated your valuable feedback from the previous survey.

There are 24 assessment items each on a separate page. Please rate each item and the criteria presented with the item for clarity and offer any suggestions to make the item more clear.

Each item uses the following behaviorally-based scale to assess the rated student:

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

Click below to begin the survey.

Thank you.



MMLA CI2

Item 1: Problem Solving Skills

Problem solving skills includes skills required to effectively identify a problem (clinical, academic, or military), integrate background knowledge of the problem, brainstorm possible solutions and hypotheses, and determine what additional information is needed to solve the problem and/or execute the hypotheses.

"How often does the rated student demonstrate problem solving skills?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

1. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 2: Time Management

Time management includes skills and techniques required to effectively and adequately prepare and successfully execute an assignment, task, or mission given specific time constraints.

"How often does the rated student demonstrate effective time management?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

4. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 3: Decision Making

Decision making includes the range of cognitive processes where the evaluated student identifies and selects the best course of action among more than one alternative given the constraints of the environment and time.

"How often does the rated student demonstrate effective decision making?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

7. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 4: Learning

Effective learning includes the continuous cognition (i.e., thoughts), behaviors, and motivations necessary for the evaluated student to adapt and master competencies required to be an outstanding uniformed physician.

"How often does the rated student continue to learn?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

10. How clear is this criteria?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

11. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

12. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 5: Mission Focus

Mission focus includes cognitive processes, behaviors, and competencies required for the evaluated student to remain committed to successfully achieving a given mission (i.e., a mission from a higher authority) and the mission of the organization.

"How often does the rated student remain focused on given mission(s) and the mission of the university?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

13. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 6: Oral Communication

Effective oral communication includes skills, competencies, and behaviors necessary for the evaluated student to express information by speaking and have that information understood by the intended recipient(s).

"How often does the rated student demonstrate effective oral communication?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

16. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 7: Non-verbal Communication

Non-verbal communication includes behaviors required to complement verbal communication so that the information conveyed is better understood by the intended recipient(s). Examples include hand gesture, eye contact, body posture, and facial expressions.

"How often does the rated student demonstrate effective non-verbal communication?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

19. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 8: Written Communication

Written communication includes any skills, traits, and competencies required to effectively convey information through written words or symbols and that the information is understood by the intended recipient(s).

"How often does the rated student demonstrate effective written communication?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

22. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 9: Listening Skills

Listening skills includes the cognitive processes and behaviors required to effectively hear and understand audible communication.

"How often does the rated student demonstrate effective listening skills?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

25. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 10: Collaboration

Collaboration includes skills and competencies required for the evaluated student to effectively work jointly with others especially given physical, psychological (i.e., under stress), or time constraints.

"How often does the rated student collaborate with others?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

28. How clear is this criteria?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

29. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

30. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 11: Motivation

Motivating others includes skills, traits, competencies, and behaviors necessary to effectively influence others to commit and achieve individual and group goals. Motivating others should not rely on aversive leadership behaviors (i.e., toxic leadership) but should focus on person-based interactions designed to intrinsically motivate peers and subordinates.

"How often does the rated student motivate others?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

31. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

33. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 12: Mentorship

Mentorship includes the interpersonal skills and relationships by which the rated student guides others given the rated student's competency or expertise.

"How often does the rated student mentor others?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

34. How clear is this criteria?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

35. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

36. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 13: Accountability

Accountability includes those behaviors and attitudes required for the rated student to hold themselves answerable to individual and organizational answerability and liability.

"How often does the rated student demonstrate accountability?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

37. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

38. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

39. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 14: Emotional Intelligence

Emotional Intelligence includes those skills, traits, and behaviors by which the rated student is aware and manages their own emotions and is aware of the emotions of others.

"How often does the rated student demonstrate a high level of emotional intelligence?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

40. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

41. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

42. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 15: Leading by Example

Leading by example includes how well the rated student uses their own leadership behaviors, skills, and traits to provide a high standard for others to emulate.

"How often does the rated student lead by example?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

43. How clear is this criteria?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

44. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

45. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 16: Selflessness

Selflessness includes the behaviors and traits by which the rated student places the needs of others (peers, subordinates, and the organization) before their own.

"How often does the rated student demonstrate selflessness?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

46. How clear is this criteria?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

47. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

48. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 17: Self-Awareness

Self-Awareness is the introspective ability for the rated student to recognize their own actions as deliberate and distinct from others. In military medical leadership, **Self-Awareness** also includes the capacity for the rated student to make objective evaluations of their own traits, behaviors, and beliefs.

"How often does the rated student demonstrate self-awareness?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

49. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

50. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

51. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 18: Patience

Patience includes resiliency, endurance, and capacity to persevere under difficult or challenging circumstances without resorting to negative emotions and behaviors. Patience in military medical leadership includes interactions with peers, patients, subordinates, and leaders.

"How often does the rated student display patience?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

52. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

53. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

54. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 19: Adaptability

Adaptability includes behaviors, traits, and cognitions required to effectively respond to changes in the physical, psychological, and social environment. Additionally, adaptability is also a measure of the rated student to cope with unexpected changes.

"How often does the rated student demonstrate a adaptability?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

55. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

56. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

57. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 20: Integrity

Integrity includes traits, behaviors, and beliefs that are concurrent with strong and internally consistent moral principles. Integrity in military medical leadership includes honesty and non-maleficence.

"How often does the rated student show integrity?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

58. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

59. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

60. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 21: Responsibility

Responsibility includes the behaviors and traits necessary for the rated student to hold themselves personally accountable to ensure personal and organizational success, as well as the motivation to act independently when appropriate.

"How often does the rated student take responsibility?"

[Almost Never--Infrequently---Sometimes---Often---Almost Always---Not Observed]

61. How clear is this criteria?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

62. How clear is this question?

Not at all

Slightly Clear

Moderately Clear

Very Clear

☐☐☐☐

63. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 22: Confidence

Confidence includes traits and behaviors that indicate the rated student has self-assurance in their own abilities and competence. In military medical leadership, confidence also includes an attitude conducive to continued personal and professional growth.

"How often does the rated student display confidence?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

64. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

65. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

66. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 23: Creativity

Creativity includes the cognitive capacity for the rated student to generate new ideas and solutions. Creativity in military medical leadership also includes traits and behaviors required to generate products or ideas that are useful and (when applicable) improve previous models and paradigms.

"How often does the rated student show creativity?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

67. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

68. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

69. Please add any comments that you feel would improve the quality of the criteria and/or question



MMLA CI2

Item 24: Cultural Sensitivity

Cultural sensitivity includes awareness of how differences and similarities among different cultures influence values, learning, and behavior. Cultural sensitivity in military medical leadership also includes self-awareness of the rated student's own culture and how that influences interactions with peers, subordinates, leaders, and patients.

"How often does the rated student show cultural sensitivity?"

[Almost Never---Infrequently---Sometimes---Often---Almost Always---Not Observed]

70. How clear is this criteria?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

71. How clear is this question?

Not at all	Slightly Clear	Moderately Clear	Very Clear
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

72. Please add any comments that you feel would improve the quality of the criteria and/or question

APPENDIX C: Study Information Sheet

Information Sheet (Delphi Panel)

1. INTRODUCTION OF THE STUDY

You are being asked to be in a research study entitled, **Creating a Military Medical Leadership Assessment Instrument Using the Delphi Method** at the Uniformed Services University of the Health Sciences (USUHS), Bethesda, Maryland. You have been identified by leadership development faculty at the Uniformed Services University as someone who has valuable experience in leadership. This information sheet provides information about the research study. Once you understand the study, you can decide if you want to take part in this research study. Your decision to take part is voluntary. This means you are free to choose if you want to take part in this study. By completing and submitting the questionnaire, you have consented to participate in this study. If you do not wish to be contacted again, please notify the primary investigator, CPT Matthew Moosey at mmoosey@usuhs.edu and there will be no future contact.

2. PURPOSE AND PROCEDURES

The purpose of this study is to create a new assessment tool to assess medical leadership in uniformed medical students at USUHS. The questions asked will be related to leadership, medical leadership, and military medical leadership. This information will help us understand more about how to assess leadership in military medicine and will provide feedback on the overall effectiveness of leadership development programs at USUHS. We will use this information in the future to better design leadership development at USUHS and advance medical leadership throughout the Military Health System (MHS).

This research study consists of a series of approximately 5-7 emailed questionnaires over the course of 6 months (approximately one questionnaire a month). These questionnaires are designed to identify important components of military medical leadership and create an assessment tool based on your input. You will be collaboratively working with other leadership experts, although you will remain anonymous to each other. Your identity will only be known to the Primary Investigator, CPT Moosey, and his research associates. It will take you approximately 30 minutes to complete each questionnaire. The questionnaires will be provided through a link to the study's website, <https://www.research.net/s/MilMedLeadershipQ1>. When filling out the questionnaires, you may skip any questions you do not wish to answer. With each questionnaire, you will be provided with descriptive statistics about how other leadership experts answered previous questions. The first questionnaire will ask you to provide demographic data about yourself (age, race/ethnicity, gender, educational level, occupational specialty) and a brief description of your leadership experiences. All of this personal information will be kept secure on the study's website and on Department of Defense (DoD) secured computers at USUHS. At the end of the study, you will be provided with a final copy of the assessment tool for you to use in your own organizations as you see appropriate.

3. POSSIBLE BENEFITS FROM BEING IN THIS STUDY

There will be no direct benefit to you from participating in this research.

4. COMPENSATION

There is no financial compensation for your participation in this research.

5. ALTERNATIVE PROCEDURES/TREATMENT

The only alternative to participating in this study is, not participating.

6. POSSIBLE RISKS OR DISCOMFORTS FROM BEING IN THIS STUDY

There are no known expected risks or discomforts from being in this study.

7. RIGHT TO WITHDRAW

You may decide to stop taking part in the study at any time. Your relations with the faculty, staff, and USUHS will not be changed in any way if you decide to end your participation in the study.

8. RECOURSE IN THE EVENT OF INJURY

If at any time you believe you have suffered an injury or illness as a result of participating in this research project, you should contact the Director of Human Research Protections Programs at the Uniformed Services University of the Health Sciences, Bethesda, Maryland 20814-4799 at (301) 295-9534. This office can review the matter with you, can provide information about your rights as a subject, and may be able to identify resources available to you. If you believe the government or one of the government's employees (such as a military doctor) has injured you, a claim for damages (money) against the federal government (including the military) may be filed under the Federal Torts Claims Act. Information about judicial avenues of compensation is available from the University's General Counsel at (301) 295-3028.

9. PRIVACY AND CONFIDENTIALITY

All information you provide as part of this study will be confidential and will be protected to the fullest extent provided by law. Your responses to our questionnaire will be maintained in password-protected archives at USUHS. All records related to this study will be accessible to those persons directly involved in conducting this study and members of the USUHS Institutional Review Board (IRB), which provides oversight for protection of human research volunteers. In addition, the IRB at USUHS and other federal agencies that help protect people who are involved in research studies may need to see the information you give us. Other than those groups, records from this study will be kept private to the fullest extent of the law. Scientific reports that come out of this study will not use your name or identify you in any way. If you are a military member, please be advised that under Federal Law, a military member's confidentiality cannot be strictly guaranteed.

10. CONTACT FOR QUESTIONS OR PROBLEMS

If you have questions about this research, you should contact CPT Matthew Moosey, the lead researcher at 301-758-5703 or at mmoosey@usuhs.edu. Even in the evening or on weekends, you can leave a message at that number. If you have questions about your rights as a research subject, you should

call the Director of Human Research Protections Programs at USUHS at (301) 295-9534. She is your representative and has no connection to the researcher conducting this study.

****IF YOU HAVE ANY QUESTIONS PLEASE FEEL FREE TO ASK THEM****

By clicking on the enclosed questionnaire link, you indicate that you have read the explanation of this study on this form, the procedures have been reviewed, and all your questions have been answered. You understand the nature of the study and volunteer to participate in it. You attest that you meet the requirements for participation in this study. You understand that the study is designed for research purposes and not to be of direct benefit to you.

Information Sheet (Cognitive Interview)

1. INTRODUCTION OF THE STUDY

You are being asked to be in a research study entitled, **Creating a Military Medical Leadership Assessment Instrument Using the Delphi Method** at the Uniformed Services University of the Health Sciences (USUHS), Bethesda, Maryland. You have been identified by leadership development faculty at the Uniformed Services University as someone who has valuable experience in leadership education. This information sheet provides information about the research study. Once you understand the study, you can decide if you want to take part in this research study. Your decision to take part is voluntary. This means you are free to choose if you want to take part in this study. By completing and submitting the questionnaire, you have consented to participate in this study. If you do not wish to be contacted again, please notify the primary investigator, CPT Matthew Moosey at mmoosey@usuhs.edu and there will be no future contact.

2. PURPOSE AND PROCEDURES

The purpose of this study is to create a new assessment tool to assess medical leadership in uniformed medical students at USUHS. The questions asked will be related to leadership, medical leadership, and military medical leadership. This information will help us understand more about how to assess leadership in military medicine and will provide feedback on the overall effectiveness of leadership development programs at USUHS. We will use this information in the future to better design leadership development at USUHS and advance medical leadership throughout the Military Health System (MHS).

This research study consists of a series of approximately 2-3 emailed questionnaires over the course of 2 months (approximately one questionnaire a month). These questionnaires are designed to clarify create an assessment tool based on your input. You will be collaboratively working with other leadership experts, although you will remain anonymous to each other. Your identity will only be known to the Primary Investigator, CPT Moosey, and his research associates. It will take you approximately 30 minutes to complete each questionnaire. The questionnaires will be provided through a link to the study's website, <https://www.research.net/s/MilMedLeadershipC1>. When filling out the questionnaires, you may skip any questions you do not wish to answer. At the end of the study, you will be provided with a final copy of the assessment tool for you to use in your own organizations as you see appropriate.

3. POSSIBLE BENEFITS FROM BEING IN THIS STUDY

There will be no direct benefit to you from participating in this research.

4. COMPENSATION

There is no financial compensation for your participation in this research.

5. ALTERNATIVE PROCEDURES/TREATMENT

The only alternative to participating in this study is, not participating.

6. POSSIBLE RISKS OR DISCOMFORTS FROM BEING IN THIS STUDY

There are no known expected risks or discomforts from being in this study.

7. RIGHT TO WITHDRAW

You may decide to stop taking part in the study at any time. Your relations with the faculty, staff, and USUHS will not be changed in any way if you decide to end your participation in the study.

8. RECOURSE IN THE EVENT OF INJURY

If at any time you believe you have suffered an injury or illness as a result of participating in this research project, you should contact the Director of Human Research Protections Programs at the Uniformed Services University of the Health Sciences, Bethesda, Maryland 20814-4799 at (301) 295-9534. This office can review the matter with you, can provide information about your rights as a subject, and may be able to identify resources available to you. If you believe the government or one of the government's employees (such as a military doctor) has injured you, a claim for damages (money) against the federal government (including the military) may be filed under the Federal Torts Claims Act. Information about judicial avenues of compensation is available from the University's General Counsel at (301) 295-3028.

9. PRIVACY AND CONFIDENTIALITY

All information you provide as part of this study will be confidential and will be protected to the fullest extent provided by law. Your responses to our questionnaire will be maintained in password-protected archives at USUHS. All records related to this study will be accessible to those persons directly involved in conducting this study and members of the USUHS Institutional Review Board (IRB), which provides oversight for protection of human research volunteers. In addition, the IRB at USUHS and other federal agencies that help protect people who are involved in research studies may need to see the information you give us. Other than those groups, records from this study will be kept private to the fullest extent of the law. Scientific reports that come out of this study will not use your name or identify you in any way. If you are a military member, please be advised that under Federal Law, a military member's confidentiality cannot be strictly guaranteed.

10. CONTACT FOR QUESTIONS OR PROBLEMS

If you have questions about this research, you should contact CPT Matthew Moosey, the lead researcher at 301-758-5703 or at mmoosey@usuhs.edu. Even in the evening or on weekends, you can leave a message at that number. If you have questions about your rights as a research subject, you should call the Director of Human Research Protections Programs at USUHS at (301) 295-9534. She is your representative and has no connection to the researcher conducting this study.

****IF YOU HAVE ANY QUESTIONS PLEASE FEEL FREE TO ASK THEM****

By clicking on the enclosed questionnaire link, you indicate that you have read the explanation of this study on this form, the procedures have been reviewed, and all your questions have been answered. You understand the nature of the study and volunteer to participate in it. You attest that you meet the requirements for participation in this study. You understand that the study is designed for research purposes and not to be of direct benefit to you.

APPENDIX D: IRB Approval



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4712
(www.usuhs.mil)



February 12, 2015

MEMORANDUM FOR CPT MATTHEW MOOSEY, STUDENT, DEPARTMENT OF
MEDICAL AND CLINICAL PSYCHOLOGY

SUBJECT: USUHS IRB #1 (FWA 00001628; DoD Assurance P60001) Approval of TO-72-
3326 for Human Subjects Participation

Congratulations! The Initial Review for your No More Than Minimal Risk human subjects research protocol TO-72-3326, entitled "Creating a Military Medical Leadership Assessment Instrument Using the Delphi Method," was reviewed and approved for execution on February 12, 2015 by Edmund Howe, M.D., J.D. under the provision of 32 CFR 219.110(b)(1)(Suppl. F17). This approval will be reported to the USU IRB #1 scheduled to meet on March 12, 2015.

The purpose of this project is to create a Military Medical Leadership Assessment Instrument (MMLAI) for USU faculty to assess uniformed medical students.

Authorization to conduct protocol TO-72-3326 will automatically terminate on February 11, 2016. If you plan to continue data collection or analysis beyond this date, IRB approval for continuation is required. Please submit a USU Form 3204 A/B, application for continuing approval 60 days prior to your termination date. You will receive a reminder from IRBNet.

You are required to submit amendments to this protocol, changes to the informed consent document (if applicable), adverse event reports, and other information pertinent to human research for this project in IRBNet. No changes to this protocol may be implemented prior to IRB approval. If you have questions regarding this IRB action or questions of a more general nature concerning human participation in research, please contact Trish Healy at 301-295-3388 or patricia.healy@usuhs.edu.

Edmund G. Howe, M.D., J.D.
Chair, IRB #1

Concurred/Nonconcur

Arthur L. Koflermann, MD, MPH
Professor and Dean, School of Medicine

This document has been signed electronically.

Electronic Signature Notice: In accordance with the "Government Paperwork Elimination Act" (GPEA) (Pub. L. 105-297, codified at 44 USC 3504), Federal and DOD applicable instructions, directives and regulations, documents have been electronically signed and certified by all who have been required to do so. These signatures have the same effect as their paper-based counterparts. Verification is claimed within our protected electronic records and archives.

APPENDIX E: Final Draft of MMLA

Military Medical Leadership Assessment (MMLA) Version 1.0 Instructions and Item Criteria

Directions: The following assessment is intended to assess medical leadership skills and proficiencies. For the evaluated student, read each item criteria and select a value on the attached grade sheet based on your observation of the student during the evaluated period. If an item was not observed then mark “not observed.”

COMMUNICATION

1. Oral communication includes skills, competencies, and behaviors to express information by speaking and have that information understood by the intended recipient(s).
How often does the student demonstrate effective oral communication?
2. Non-verbal communication includes behaviors to complement verbal communication so the information conveyed is better understood by the intended recipient(s) (e.g., hand gesture, eye contact, body posture).
How often does the student demonstrate effective non-verbal communication?
3. Written Communication includes skills and competencies to effectively convey information through written words or symbols and that the information is understood by the intended recipient(s).
How often does the student demonstrate effective written communication?
4. Listening effectively includes attention, information processing, and behaviors to understand audible communication.
How often does the student demonstrate effective listening?
5. Collaborating includes attitudes and behaviors to effectively work with other.
How often does the student demonstrate collaboration?
6. Motivating others involves influencing others to care about and work to achieve individual and group goals.
How often does the student demonstrate motivation of others?
7. Mentoring includes guiding and advising others.
How often does the student demonstrate mentoring of others?

COMPETENCE

8. Problem solving includes skills to effectively identify a problem (clinical, academic, or military), integrate background knowledge of the problem, brainstorm possible solutions and hypotheses, and determine what additional information is needed to solve the problem.
How often does the student demonstrate effective problem solving?
9. Decision making includes thought processes identifying and selecting the best course of action among more than one alternative.
How often does the student demonstrate effective decision making?

10. Time management involves effectively allocating time to successfully execute a task or mission.
How often does the student demonstrate effective time management?
11. Learning effectively involves attitudes and behaviors to gain new knowledge and skills or to build upon past knowledge and skills.
How often does the student demonstrate learning?
12. Mission focus includes attitudes and behaviors required to successfully achieving a given mission.
How often does the student demonstrate mission focus?

CHARACTER

13. Self-awareness is the ability to make objective evaluations of oneself.
How often does the student demonstrate self-awareness?
14. Emotional intelligence involves Self-awareness and Self-regulation of one's own emotions and understanding with empathy the emotions of others.
How often does the student demonstrate emotional intelligence?
15. Selflessness includes attitudes (e.g., humility) and behaviors that places needs of others (peers, subordinates, and the organization) before their ones' own.
How often does the student demonstrate selflessness?
16. Leading by Example includes behaviors that provide a high standard for others to emulate.
How often does the student demonstrate leading by example?
17. Accountability includes those attitudes and behaviors to hold themselves answerable to individual and organizational standards necessary to be responsible for one's actions.
How often does the student demonstrate accountability?
18. Integrity: Integrity includes traits, behaviors, and beliefs that are concurrent with strong and internally consistent moral principles.
How often does the student demonstrate integrity?
19. Patience includes calm demeanor, resiliency, endurance, and capacity to persevere under difficult or challenging circumstances without resorting to negative emotions and behaviors.
How often does the student demonstrate patience?
20. Adaptability involves responding effectively to changes in the physical, psychological, and social environment.
How often does the student demonstrate adaptability?
21. Confidence includes attitudes and behaviors that indicate Self-assurance in one's own abilities and competence.
How often does the student demonstrate confidence?
22. Responsibility includes attitudes and behaviors to be accountable to ensure personal and organizational success, as well as the motivation to act independently when appropriate.
How often does the student demonstrate responsibility?

CONTEXT

23. Creativity includes generation of new ideas and solutions.

How often does the student demonstrate creativity?

24. Cultural Sensitivity includes attitudes and behaviors of how differences and similarities among different cultures influence values, learning, and behavior. Cultural sensitivity also includes Self-awareness of one's own culture and how that influences interactions with peers, subordinates, leaders, and patients.

How often does the student demonstrate cultural sensitivity?

Medical Military Leadership Assessment (MMLA) Version 1.1 Scoresheet (Refer to the Instructions for Evaluation Criteria)							
Student Name:				Evaluator:			Date:
Item	Almost Never (0-20% of time)	Infrequently (21-40% of time)	Sometimes (41-60% of time)	Often (61-80% of time)	Almost Always (81-100% of time)	Not Observed	Comments
COMMUNICATION							
Oral Communication							
Non-Verbal Communication							
Written Communication							
Listening							
Collaborating							
Motivating							
Mentoring							
COMPETENCE							
Problem Solving							
Decision Making							
Time Management							
Learning							
Mission Focus							
CHARACTER							
Self-Awareness							
Emotional Intelligence							
Selflessness							
Leading By Example							
Accountability							
Integrity							
Patience							
Adaptability							
Confidence							
Responsibility							
CONTEXT							
Creativity							
Cultural Sensitivity							
Overall Comments:							

APPENDIX F: Delphi Panel Demographics

Gender	N	Professional Specialty	N
Male	18	Physician	6
Female	15	Nurse	5
Age		Dentist	2
21-29	2	Health Care Admin (Mil)	4
30-39	6	Health Care Admin (Civ)	2
40-49	14	Other Non-Physician Provider	2
50-59	8	Military Line Commander	4
60 or older	3	NCO -- Medical	2
Race & Ethnicity		NCO -- Line	1
Asian/ Pacific Islander	2	Civilian Community Leader	5
Black/ African American	4	Military Rank	
Latino-a/ Hispanic	2	E7-E9	3
Multiple Races	3	O1-O3	1
White	22	O4-O5	6
Education Level		O6	14
Some College/ Associate's	4	O7-O9	2
Bachelor's	3	N/A (Civilian)	7
Master's	13	Percentages	%
Doctorate (PhD, PsyD, DNP, JD)	4	Ethnic Minority	33%
MD/DO	7	Women	45%
DDS/DMD	2	Civilian	20%
Branch of Service		Physicians	18%
Army	8	Nurses	15%
Marine Corps	2	Military Line Leaders	15%
Navy	8	Civilian Community Leaders	15%
Coast Guard	1	Civilian Healthcare Leaders	9%
Public Health Service	2	Enlisted	10%
Air Force	4	Officers	70%
N/A (Civilian)	8	Total N	33

APPENDIX G: Coding Strategy

M.J. Moosey April 14, 2015

Introduction: The following standard operating procedure (SOP) is for coders assigned to the Military Medical Leadership Assessment (MMLA) project. This SOP is meant to guide the coder through the process of taking raw, unedited responses by the Delphi expert panel members and categorizing these responses in a way that helps develop a tool that will be used by faculty to assess medical students.

BLUF: As a coder, you will read the open ended responses of the Delphi experts and interpret these responses in such a way that will support the creation of a brief (half standard 8x10 page to single standard 8 x 10 page) assessment instrument.

Current form of the Data: The first questionnaire (MMLA Q1) asked the expert panel members to describe their personal demographics and leadership experience. The final question asked the following:

“please list any terms, concepts, or ideas you believe are important to developing medical leadership skills in uniformed medical students”

Some experts wrote detailed narratives, others listed bulleted items, while others wrote a mixture of forms.

How the Data Need to be Transformed: Concepts and ideas expressed in such a manner that an MEM faculty would be able to assess an individual medical student.

The Challenge: There is no “incorrect” way to code the responses. As a coder, you should rely on your own judgment to interpret the expert panel’s open ended responses and transform these responses in a way that will be used to create an assessment tool.

An Example: In order to avoid biasing you as a coder, the following example is fictional and NOT taken from MMLA Q1.

Hypothetical Question 1: Please list any terms, concepts, or ideas you believe are important to developing competency in WMTA Metro rail operators.

Hypothetical Expert 1 Response: A Metro Rail operator must, above all else, place the safety of his crew and passengers as paramount. I have seen far too many preventable accidents due to lackadaisical safety protocols. Additionally, a Metro rail operator should be a clear communicator and should train extensively on new communications protocols. Finally, a Metro rail operator should be flexible and prepared to educate themselves on new routes, equipment, schedules, and customer service.

Hypothetical Expert 2 Response:

Safety and training

Commitment and dedication

Customer service

Kindness

Security

Trust

Comment on First Response: The first response is a narrative where the second response is a list. For the first response, you will need to read each sentence then list words that will accurately summarize the sentence and may be expressed in an assessment instrument. For instance,

“A Metro Rail operator must, above all else, place the safety of his crew and passengers as paramount”

Scan for the most essential word or words that capture the essence of the statement using as few words as possible.

CODE1: Safety

Potential assessment question that might be developed based on Code 1: How well does the rail operator follow WMTA safety protocols for their crew and passengers?

Note: Do not worry about the potential assessment question because there may be numerous ways to ask this question. The experts and the cognitive interview participants will address those finer stylistic questions. You then move on and perform the same analysis and coding on each sentence in the narrative.

Comment on Second Response: At first look, the second response might appear to be easier to code for purposes of assessment because the responses are already expressed as singular concepts. However, be careful because some of the terms should be separated whereas others may be coded as a single item. For instance

“Safety and training”

Safety and training, although related in some instances, might be different. Therefore:

CODE1: Safety

CODE2: Training

Potential Assessment Question 1: How well does the rail operator follow WMTA safety protocols for their crew and passengers?

Potential Assessment Question 2: How well does the rail operator learn required annual rail operator training?

Conversely, items may be similar enough to be coded as a single item

“Commitment and dedication”

CODE3: Commitment

Potential Assessment Question 3: How well does the rail operator commit to the WMTA organizational values?

Conclusion: Apply sufficient brain power to appropriately code an item and move on. Do not overthink your coding strategy or agonize over an item. Rely on and trust your judgment. Additionally, it is important NOT to communicate with other coders about your work. We want to minimize potential biases in your coding. Thank you again for your time and efforts.